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ROYAL COMMISSION ON THE SANITARY STATE OF TH
ARMY IN INDIA.

VOL. II.

APPENDIX.

00108724

REPORTS FROM STATIONS IN INDIA AND DEPENDENCIES *OCCUPIED* BY BRITISH AND BY NATIVE TROOPS.

REPORTS OF INSPECTORS-GENERAL OF HOSPITA

REPORTS ON STATIONS IN CEYLON.

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LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

1863.

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APPENDIX TO THE EVIDENCE

TAKEN BEFORE THE

ROYAL COMMISSION APPOINTED TO INQUIRE INTO THE SANITARY CONDITION OF THE INDIAN ARMY.

REPORTS ON THE SANITARY CONDITION OF STATIONS.

QUESTIONS

HAVING REFERENCE TO THE SANITARY CONDITION OF HER MAJESTY'S TROOPS IN INDIA, AND OF THE EUROPEAN AND NATIVE TROOPS IN THE INDIAN ARMY.

To which Answers are required by the Commissioners from every Station throughout India and its Dependencies.

(*The Answers are to be written on the Margin opposite each Question.*)

(It is, wherever practicable, that the Answers should be filled up and signed below, concurrently, by the Commanding Officer, the Engineer, and the Medical Officer of the Station.)

Name of Presidency _____

Name of Station _____

Strength (non-commissioned officers and men) of each denomination of troops and arms for which there is accommodation at the Station _____

Queen's Troops, or European Troops of the Indian Army.	Artillery	_____
	Cavalry	_____
	Infantry	_____
Native Troops -	Artillery	_____
	Cavalry	_____
	Infantry	_____

Date _____

Signatures _____

References to Subjects.	QUERIES.
I. TOPOGRAPHY.	1. What is the general aspect of the country surrounding the station? Is it flat, hilly, mountainous, sandy, dry, or swampy? Is there much wood, jungle, or water in the vicinity? 2. What is the elevation of the station above— (1.) The sea? (2.) The adjacent country? (3.) The nearest water, lake, river, canal, nullah, or marsh? Is there any higher and healthier ground adjoining the station? if so, state its nature and elevation above the station, with any advantages or disadvantages attending it for military purposes. 3. At what distance from the station is the nearest mountain or table-land? and state approximately the height of such higher ground above the level of the station. 4. At what distance from the station is the nearest water, whether sea, river, lake, marsh, nullah, or canal? Is the vicinity liable to overflow of water? if so, at what season, and how long does the overflow last? Is there any broken ground, or are there any ravines or water pits near the station; and what is their effect on health? 5. Is the station open and freely exposed to winds? or is it so encumbered with trees, hedges, and gardens, or surrounded by trees, or by higher ground, or by houses or walls, as to interfere with free external or internal ventilation? Is the temperature of the station raised by the buildings being exposed to reflected sun-heat? Is the station exposed to cold or variable winds; to land winds, or to the sea-breeze, and what is their effect upon health? 6. Is the surrounding country cultivated or uncultivated? Are there any works of irrigation near the station; if so, at what distance are they? Is artificial irrigation observed to have any effect on the health of the station? Is the cultivation of rice prohibited within certain limits? if so, state the limits or distance from the station to which the cultivation of rice is restricted. Is the cultivation of indigo, or the preparation of hemp or flax carried on near the station? if so, at what distance? Is there any nuisance or injury to health in consequence? 7. Is there any large city, town, or native population in the vicinity of the station, and at what distance?

References to Subjects.	Queries.
I. Topography—*cont.*	8. State generally the geological structure, surface, and subsoil of the district; and whether the station occupies new ground, or ground which had been occupied by population before the present station was formed? 9. At what depth below the surface is water usually found:—during the dry season? During the rainy season? 10. Does the rain-fall, or the water from surface springs in the district within which the station is situated flow readily away; does it sink into a pervious subsoil, and so drain off; or does it ooze out again near the level of the station; or does it lie on the surface until it evaporates? State whether there be any adjacent higher ground, the drainage from which must necessarily pass into the subsoil of the station. 11. Whence is the water-supply of the station derived; is it from river, lake, wells, marsh, or rain-fall? Is it stored in open tanks; if so, state the extent of the tank surface both within the station and within half a mile of it? State whether the tanks are generally full or dry; The nature of the plants and animals they contain; Whether any tank used for drinking purposes is also used for bathing; Whether the water tank or well is liable to pollution from leaves or other matter falling into it; whether any foul drainage or surface impurities are allowed to drain into tanks containing drinking water; Whether nuisance or malaria proceeds from any tanks within or without the station, and the best means of preventing such nuisance or malaria? 12. State the amount of the water-supply available for the station, its sensible qualities as to colour, taste, and smell; If possible, its chemical composition, its hardness or softness, its microscopic characters; and state generally whether you consider the quality of the water as good, and not injurious to health, and whether its amount is sufficient? State the means for raising and distributing it for use; also whether any better water-supply could be obtained, with any recommendations you may have to make on the subject. 13. State any other topographical points bearing on the health of the station not included in these queries. 14. By whom, and after what amount or kind of inquiry or examination as to topography, climate, diseases, sanitary condition, &c., are new stations selected, whether on hills or plains; and could you suggest any improvements in the way this service should be conducted?
II. Climate.	1. What means and instruments are available at the station for conducting and registering meteorological observations? 2. Prepare and transmit a meteorological table for as many years past as possible, arranging the facts, so far as the observations at your disposal will admit, in the following form:—

Years of Observation from 18 to 18 ..

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.*	Winds.		Days of Sunshine.	Remarks as to Cloud, Dew, Wind, Storms, &c.
										Direction.	Force.†		
January													
February													
March													
April													
May													
June													
July													
August													
September													
October													
November													
December													

The Table should contain as many observations on these points as can be obtained.

* If the rain-fall cannot be given in inches, some expression should be used to give an idea of the amount of rain, such as "Dry Weather," "Rain," "Much Rain," &c.

† In describing the force, the following terms may be used:—"Calm," "Moderate," "High Winds," "Gales," "Storm," "Hurricane," "Monsoon."

3. State generally your opinion in regard to the character of the climate, its dryness, moisture, heat, variability, cold, fog, damp, tree planting, canal irrigation, or irrigation of any kind, as influencing the climate generally; purity or impurity of the air from dust or other admixtures affecting the atmosphere over large areas of country;
   Also its influence on the health of the troops, and on the kind of diet, shelter, and clothing required, and the precautions as to the amount, nature, and times of drills, duties, and exercises which the climate renders necessary;
   State which are the most healthy and which are the most unhealthy months at the station; state also which are the prevailing diseases during the unhealthy months.
4. Is there any district near the station the climate of which is more conducive to health than that of the station; if so, will you state its name, distance, elevation above the station, the nature of its drainage and water supply, and generally those circumstances which appear to render it more healthy, and any reasons which may exist for or against its adoption?
5. Will you transmit a list of the stations on which you have served, with your observations on the comparative salubrity, stating which were and which were not conducive to health, or positively injurious?

QUERIES.

4. It should be stated in what months troops usually arrive in the Presidency from England, whether any restriction for preserving their health is placed upon the men on arriving; whether there is any place of resort provided for the men, or whether they are allowed to go at large; whether there is much drunkenness amongst the men after landing, and whether much preventible disease arises from such irregularities; how long the troops remain at the port after disembarkation and before proceeding to the interior; what precautionary measures are in use for protecting their health during the voyage or journey.

5. It would be important to state the general result of experience as regards the Queen's troops and European troops of the Indian Army on the following points:—
   (1.) As to the best age for a soldier landing in India.
   (2.) As to the amount of previous service desirable before arriving in India.
   (3.) How he ought to be disposed of on landing, and what would be the best mode of life during his first years of service.
   (4.) The routine of stations, the length of time he should serve on hills and plains, and the total length of his service in India.
   (5.) The marriages of soldiers; the present regulations in regard to this; with any suggestions for improving such regulations.

6. Any additional recommendations or suggestions which past experience has shown to be requisite for protecting the health of troops after landing during the transit to the interior, in stations, on the march, or in camp, should be given.

7. A list of hospital equipments according to existing Presidency Regulations, for 100 or any other convenient number of men—
   (1.) For station hospitals.
   (2.) For field hospitals.

With any additions or improvements in these equipments that can be suggested, and in the hospital regulations generally.

Military and medical officers at stations should also add any additional information which they may think of importance, besides that required by the questions.

ANSWERS.

BENGAL PRESIDENCY.

CALCUTTA.—FORT WILLIAM.

Accommodation	Queen's Troops	Artillery - - 80 H.M.S. 5th Fusiliers and 37th Regiment.
	Native Troops	Governor General's Body Guard. The Alipore Regiment and Police Battalion.

References to Subjects and Queries.	[illegible]PLIES.

I. TOPOGRAPHY.

1. The surrounding country is a plain covered with jungle, rice fields, native villages, garden houses, marshes, stagnant water, and low grass jungles. The fort has a circumference of 3 miles, and is surrounded by an open esplanade about half a mile wide. The adjacent country is flat and in many places swampy. There are numerous tanks in the vicinity of the station, and a considerable surface of stagnant water in the rainy season. Within the municipal limits of Calcutta there are 1,043 tanks, with a total area of no less than one 26th of that of the city. The river Hoogly, 2,000 feet in width, flows past the west of the town and fort.

2. The elevation of the station above the sea is 18·16 feet by the barometrical measurements of the Surveyor-General. The direct distance of Calcutta from the sea is 67 miles. The station is on a level with the adjacent country, and but little more than 1 foot above the mean of high water in the river. There is said to be a fall from the bank of the river in the direction of the salt water lake. Alipore, a suburb to the S.E. of the city, is a little higher and better drained than the other suburbs. Its soil also is sandy. Balleegunge, to the immediate east of Calcutta, is open and airy, with a sandy soil, well calculated to carry off surplus water. The Howrah, or right bank of the Hoogly, is also said to be higher than the Calcutta side. There is no higher ground within a reasonable distance of Calcutta.

3. The Rajmahah Hills are about 130 miles from the station. A spur of these hills has been proposed as a sanitarium, but it is generally considered that it would prove unhealthy. This spur, Parasnauth, is 188 miles from Calcutta, near the Grand Trunk Road, and is 4,233 feet in height. It is granitic.

4. The nearest water is the river Hoogly, which runs to the immediate west of the town and fort. The circular canal lies to the N. and N.E. of the city, and Tully's nullah to the north. The salt water lake, a shallow brackish marsh, extending over a surface of many miles, is situated about 3 miles to the east of the city. The river sometimes overflows its banks, during the height of the rains; but there is always, after rain, much water lying on the surface in and around Calcutta, in consequence of imperfect drainage. The Drainage Committee remark that the slope of the drains is so trifling that it sometimes takes several hours to flow off. There is much broken and irregular ground in and around Calcutta, also filthy stagnant tanks and pits, which are a fertile source of disease to all who reside in their neighbourhood. The fort is pretty free from hollows for the accumulation of stagnant water; but the cunette which surrounds the fort is a cause of disease, and every effort is now being made to remedy this evil.

5. The fort is comparatively open, being surrounded by a broad glacis; but the city is surrounded by jungle, or encumbered with trees, hedges, and gardens, which must interfere with free external ventilation. The ramparts of the fort, which are 25 feet in height, interfere with free ventilation; but this cannot, of course, be avoided. There is no doubt that the temperature of Calcutta and of the fort must be considerably raised by reflected sun heat, from the numerous white-washed solid buildings, in which the troops are quartered, and the greater part of the European inhabitants reside. The upper rooms of the barracks are as cool as any part of Calcutta. During the cold season the prevailing N. and N.W. winds are bracing and invigorating. In the hot weather the prevailing S. and S.S.E. winds are from the sea; but passing over a large tract of low, inundated, and jungly land, are comparatively unhealthy.

6. The country surrounding the station is partly cultivated and partly uncultivated; the glacis of the fort is a sward. Much rice is cultivated around Calcutta, half a mile distant from the city, some of which requires artificial irrigation. I have no doubt that the increased humidity caused by irrigation coupled with a high temperature is productive of endemic disease. I am not aware that there is any limitation to the cultivation of rice in the vicinity of Calcutta; but there is no cultivation of hemp or indigo within some miles. Indigo is manufactured in the immediate neighbourhood of the planters' habitations, in which the smell of the "seetie" or refuse plant is at times most offensive; yet it is not considered a cause of disease.

7. The station is surrounded on all sides by large and populous villages. The population Calcutta is estimated at 500,000.

8. The surface of the station is alluvial, with vegetable moulds, sands, and sandy clays. [illegible] and stiff clays. It is recor[illegible]
fou[illegible]
m[illegible]

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	surface). These are somewhat below the mean tide level of the river at the different seasons.

10. The drainage is very imperfect, even in the city, and the rain fall flows slowly away, much of it sinking into the subsoil. A large proportion evaporates on the surface, causing increased humidity of the atmosphere. The drainage of Fort William is bad, but this is about to be remedied, and that of the lines of the Alipore regiment and of the body guard is pretty good in the immediate vicinity of the parade ground and huts, but very imperfect at a short distance all around. The country surrounding the station is a dead level, save at a few places in the suburbs, where the elevation is scarcely perceptible, though it is said to be sufficient to assist the drainage. No drainage from higher ground passes into the subsoil of the lines of the Alipore regiment, the Governor-General's body guard, or that of Fort William.

11. The water supply of the station is derived partly and principally from the river and tanks, partly from the rain fall, and partly from wells, but the water from the wells is generally considered brackish and unwholesome. The water used for drinking, cooking, &c. by the garrison is brought from a large tank on the glacis by native water carriers. This reservoir is 300 feet long, 200 feet wide, and from 5 to 12 feet in depth. It is filled by surface drainage. In addition to this there exist numerous other tanks within half a mile of the fort, having an aggregate superficies of 1,000,000 square feet. These are almost exclusively used by the natives of Calcutta. I have never known the Havildar's tank to be dry. After great droughts the water in it falls to 5 feet, but rarely continues so low as this for more than a few days. During the rains this tank is quite full, but it gradually falls to its minimum in the hot weather. The tanks contain a grassy fucus which grows rapidly, and has to be removed frequently, and also the pistia statistus. The fish found in them are carp, the Siluri family, Ramidæ in numbers, and infusoria. The natives frequently use the same tank both for drinking and bathing purposes, but no one is allowed to bathe in the tank used for drinking by the garrison. The water tank for the supply of the garrison is kept perfectly clean, and is generally free from foul drainage and surface impurities. From the well known careless habits of bheesties and native servants of all classes, it may not be unfairly assumed that water is sometimes taken from nearer and impurer sources of supply in the ditch. There are no tanks in the fort, and none of the tanks on the glacis or in the immediate neighbourhood of the fort are, in my opinion, a cause of disease; but in the city and in its suburbs there are innumerable tanks, many of them in a most filthy condition, which produce malaria.

12. The supply of water available for the station is sufficient for drinking and washing, but not for bathing. In consequence the Fort William special committee have recommended a steam pump for the purpose of bringing into the fort from the river a due supply of water for all purposes. The number of gallons per head was fixed at 30, and provision has been made for filtering 90,000 gallons. An efficient flushing volume will also be delivered at the head of the drains. The river water being unsuitable for six weeks annually, masonry tanks within the fort have been recommended, having storage space for two months' supply of pure water for drinking and culinary purposes, the quantity so stored to be calculated at 1 cubic foot per head per diem for 5,000 souls, and three-fourths of an inch per diem for evaporation.

The following table shows the chemical analysis of the Hooghly river water from off Fort point on the 30th April 1860, at low water, by Dr. Macnamara, professor of chemistry:—

Silica	0·5
Earthy carbonates	2·5
Sulphate of lime	0·3
Alkaline sulphates	1·1
Common salt	4·1
Alkaline carbonates, and little soluble organic matter	0·9
Solid residue from 40 ounces	9·4

The water was filtered before analysis; but the river being unusually low at the time the water was taken its impurities were probably at the maximum. The water is soft, and its quality good, and not injurious to health. The amount is sufficient for drinking purposes, but not for bathing. The water is raised and distributed by bheesties or native water carriers, the number of whom vary with the strength of regiments in the garrison. The proposed new arrangements for water supply to the fort are very perfect, and leave nothing to be desired. The total cost of conservancy and water supply is 134*l.*, viz.:—

	£
For bheesties and sweepers, with the cost of supervision	80
Establishment for regiment in garrison, about	54
	134

13. The drainage committee are carrying out a most efficient system of drainage, which, if successful, will tend much to increase the health of the town. Much good might be done by clearing the ground for a mile or two to the E. and S.E. of Calcutta, forbidding the cultivation of rice upon this space, and planting the outer edge with two or three rows of trees.

14. Committees for selecting new sites for cantonments, &c., consist of two military officers, two experienced medical officers, one civil officer or military officer in civil employ, and the executive engineer. This committee has authority to call for any information they may require on the topography, climate, diseases, &c., of the place proposed as a new site. As most of our army surgeons are well acquainted with military hygiene, the above arrangement would seem to be the most efficient that could be proposed.

Climate.

1. All our meteorological observations are conducted at the Observatory by the Government astronomer, who publishes the results weekly in the public papers. I am also supplied with a thermometer, barometer, and differential thermometer.

FORT WILLIAM. BENGAL.

References to Subjects and Queries. | Replies.

II. Climate—*cont.*

2. Table of meteorological observations for a period of five years. From December 1854 to December 1859.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January -	30·016	—	17·7	78·0	60·3	68·0	62·2	130·0	0·32	N., N.W., W.	—	29	
February -	29·962	—	17·8	82·8	64·8	73·1	66·2	132·0	0·4	S.W.	—	28	
March -	29·855	—	16·6	90·1	72·8	79·9	72·9	135·0	1·55	S.S.W.	—	26	
April -	29·772	—	16·2	93·4	77·	84·4	76·9	135·4	1·64	S.	—	26	
May - -	29·645	—	14·1	93·8	79·2	85·8	80·0	133·9	5·97	S.S.E.	—	17	
June - -	29·525	—	10·1	91·2	80·8	85·1	80·8	133·0	9·91	Do.	—	13	
July - -	29·535	—	8·1	88·3	80·2	83·4	80·1	133·0	14·05	Do.	—	—	
August -	29·595	—	7·5	87·3	79·8	82·9	79·9	126·3	15·19	Do.	—	8	
September -	29·700	—	7·8	87·62	79·7	83·1	80·0	135·8	9·60	E.S.E.	—	17	
October -	29·830	—	10·3	87·0	76·7	81·3	76·7	135·9	5·43	N.N.W.	—	24	
November -	29·980	—	14·7	82·2	67·5	74·2	67·9	129·3	—	W.N.W.	—	26	
December -	30·033	—	18·1	77·4	59·3	69·4	62·0	124·3	—	N.W.	—	28	

3. The temperature of the station is high; but extremes of heat are moderated by contiguity to the ocean, rivers, and lakes. The atmosphere is generally moist. Elevation of the thermometer in the hot, and its depression during the cold seasons are not so great as up the country, and the climate is more equable, though more humid. The air at times is very offensive and impure from malaria and effluvia in the neighbourhood of Calcutta; in Fort William much less so. Even in the fort, however, the climate affects the health and constitution of the garrison, notwithstanding every care in diet, shelter, clothing, and the utmost precautions as to the amount, nature, and times of drills, duties, and exercises. In Calcutta and its suburbs the effects of malaria and a high moist temperature are evidenced in fever, cholera, dysentery, and a large proportion of glandular disease. The healthy months extend from November to March, the unhealthy are April, May, September, and October. The prevailing diseases during the unhealthy months are remittent and intermittent fevers, cholera, small pox, and dysentery.

4. There is no district near Calcutta, the climate of which would be more conducive to the health of the troops. Dr. Chevers, in his admirable article on the means of preserving the health of European soldiers in India, in the Indian Annals of Medicine, remarks that "Chittagong, Midnapore, Balasore, Buxar, and Monghya, although not so elevated as to benefit much from the protection of the lower clouds, are thoroughly open to the prevailing cool breezes, and are therefore pleasant situations. None of these localities, however, have sufficient elevation to place them above the miasmata of the neighbouring flats."

5. The following is a list of stations at which I have served. Dum-dum, the climate of which is very similar to that of Calcutta; Beerbhoom, a healthy station, elevated, well drained, and built on red kunkur or gravel; Jessore, which has a bad reputation, being surrounded by paddy fields, jungle, jheels, filthy tanks, and stagnant water, and having a river passing through it, which possesses all the characteristics of a stagnant jheel during many months of the year; Balasore, which is salubrious to Europeans, the nights being cool in the hot weather, the wind blowing from seaward, and the station raised and well drained; Moradabad, a healthy dry station with a sandy soil; Prome in Burmah, which is unhealthy for Europeans from malaria, great average heat, and considerable vicissitudes of temperature, also from extreme and long continued humidity during the rainy season; Thyet Myo, a well known station, soil a deep fine sand with a gravelly substratum, through which the rain percolates and flows off freely. In consequence of the poverty of the soil, jungle, scanty and deciduous leaves desiccated by the dry sand; Moulmein, which is a healthy place, with an undulating surface, and rapid drainage. There is a broad river on one side of it, and a low range of hills on the other; its soil is laterite.

III. SANITARY CONDITION OF STATION.

1, 2, 3. Maps of the station and surrounding country with plan of the barracks, &c., are transmitted. With the exception of those portions which pass under the ramparts all the drains are open and constructed of masonry. No pipes of any kind are employed. No cesspits, dung heaps, or ash pits are allowed in the fort.

4. Table of barrack accommodation.

DALHOUSIE BARRACKS.—Constructed in 1859.

Total number of rooms, 36 (besides two Verandahs along the North and South Faces).

Total regulation number of non-commissioned officers and men, 612 rank and file; 13 non-commissioned officers and six serjeants. (900 men have been accommodated in this barrack without inconvenient crowding.)

Barrack Rooms.	No.	Regulation No. of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Windows. Number.	Height.	Width.	Remarks.
Eastern Ward - -	3	56	81·5	64·5	19	99066·3	1,501	79	22	13	4·5	These three wards are placed side by side, and are divided into three compartments by two longitudinal walls, pierced with numerous semicircular arches.
Centre Room - -	3	94	124½	64·5	19	151,810	1,615	85	28	13	4·5	
Western Ward - -	3	66	81·5	64·5	19	99,066	1,501	79	22	13	4·5	
Non-commissioned Officers' Quarters - -	18	19	20	15·6	19	158,479	8,341	439	66	13	4·5	This barrack is three storied, having as basement a bomb-proof of great strength, which is used as mess-room for the men, washing rooms, &c.
	3		20	11	19				6	13	4·5	
	3		20	20	19				18	13	4·5	
	3		29	10	19				12	13	4·5	

South Barracks.

Constructed in 1780.

Total number of Rooms - - - - 18.

Regulation Number of Non-commissioned Officers and Men - - 210.

Barrack Rooms.	No.	Regulation No. of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Windows. Number.	Height.	Width.	Remarks.
Soldiers' Wards - -	4	26	98·25	19·75	18·5	35,890	1,380	74·5	40	11	4·5	All these rooms are on the second story. The ventilation is free through all the wards.
Do. do. - -	2	24	77·75	19·75	18·5	28,397	1,183	64	8	11	4·5	
Do. do. - -	2	18	98·25	19·75	18·5	35,890	1,938	108	17	16·5	14	
Do. do. - -	1	16	77·75	19·75	18·5	28,397	1,774·5	96	19	16·5	14	
Non-commissioned Officers Quarters - -	4	6	25	15·25	18·5	28,212	4,703	254	12	11	4·5	

North Barracks.

Constructed in 1780.

Thirty-six Rooms for 204 Men, Rank and File, and 6 Non-commissioned Officers.

Barrack Rooms.	No.	Regulation No. of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Windows. Number.	Height.	Width.	Remarks.
Soldiers' Rooms - -	14	7	19·5	18·5	18	6,300	900	50	3	13	5	All these rooms are on the second story. The lower story is used as mess-rooms, &c. &c. Soldiers' rooms are connected by archways 15·9 span, and 14 feet high. The ventilation is unimpeded.
Do. do. - -	14	7	24	18·5	18	7,938	1,134	63	2	13	5	
Long Ward - -	1	36	239	15	18	64,800	1,800	100	24	13	5	
Non-commissioned Officers' Quarters -	1	6	38	23	18	53,838	8,973	498·5	4	13	5	
	1		25·25	15·5	18				3	13	5	
	2		18	19·5	18				10	13	13	
	2		19·5	15	18				12	13	15	
	2		23	19	18				4	13	15	

West Bomb-Proof Barracks.

Constructed in 1789.

Number of Rooms, 9 (intended for 300 Men, but the half would be too many).

Barrack Rooms.	No.	Regulation No. of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Windows. Number.	Height.	Width.	Remarks.
Side Ward - - -	1	—	215	18	10	140,400	1,404	140	6	8	8	Gumlah ventilators on the roof. Only used for invalids.
Centre - - - -	1	—	200	18	10				5	11	4	
Side - - - -	1	—	185	18	10				1	11	7	
Room - - - -	3	—	20	18	10				1	11	7	
Do. - - - -	3	—	40	18	10				1	8	8	
Do. - - - -	—	—	—	18	—				1	8	4	

East Bomb-Proof Barracks.

Constructed in 1789.

Number of Wards - - - - 9.

Barrack Rooms.	No.	Regulation No. of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Windows. Number.	Height.	Width.	Remarks.
Wards No. 1 - -	3	—	60	18	10	182,440	1,324	132	2	8	8	At present filled with Arsenal stores.
Do. No. 2 - -	3	—	96·5	18	10				1	11	74	
Do. No. 3 - -	3	—	90	18	10				3	8	8	

Queen's Barracks.

Constructed in 1858.

Rooms, 156 (for 108 Married Men and 12 Non-commissioned Officers).

Barrack Rooms.	No.	Regulation No. of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Windows. Number.	Height.	Width.	Remarks.
Private Rooms - -	108	1 family	22	12	18	513,216	4,752	264	1	13	4·5	Rooms formed by wooden partitions 8 feet high.
Do. do. - -	1	—	—	—	—	—	—	—	1	8	3·5	
Non-commissioned Officers' Quarters - -	12	8	22	20	18	186,336	—	1,294	48	13	4·5	The highest of the story 18 feet.
	12	—	22	12	18				60	13	4·5	
	12	—	11	14·5	18				48	13	4·5	

Royal Barracks.

Constructed in 1785.

Rooms on both sides, 70 (28 Sets of Quarters for Subalterns).

Barrack Rooms.	No.	Regulation No. of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Windows. Number.	Height.	Width.	Remarks.
2nd Story Quarters -	14	—	20	17	15	197,270	—	731	42	10·5	4·5	Faces east and west, has verandahs on both sides. There are two sets of mess rooms on the third story. Basement stories are used by the officers' servants.
	14	—	22·5	17	15				42	10·5	4·5	
	2	—	21·5	20	15				6	10·5	4·5	
Officers' Rooms - -	2	18 Qrs.	22·5	21·5	15				6	10·5	4·5	
	2	—	18	15	15				6	10·5	4·5	
	2	—	22·5	15	15				6	10·5	4·5	
3rd Story - - -	11	11 Qrs.	20·5	17·5	12·5	104,610	—	761	33	8	4·5	
Officers' Rooms - -	11		23	17·5	12·5				33	8	4·5	

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RAMPART BARRACKS.

Constructed in 1780.

Number of Rooms, 74 (for 4 Field Officers and 9 Captains).

Barrack Rooms.	No.	Regulation No. of Men in each Room.	Dimension of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Windows. Number.	Height.	Width.	Remarks.
Captains' Quarters	26	9	20	17	15	172,800	—	1,280	78	10	5	All the rooms are on the second story. This barrack has two portions at right angles to each other; one faces north and the other west. The lower rooms are for servants.
	18		18	14·5	15				26	10	5	
	4		28·5	20	15				9	10	5	
	12		20	17	15				72	10	5	
	2		42	17	15	129,780	—	2,163	16	10	5	
	8		18	—	15				6	10	5	
	1		29·5	11·5	15				4	10	5	

STAFF BARRACKS.

Constructed in 1784.

Seventy-two Rooms for 11 Officers.

Single Quarters	7	1	19	18	17·5	118,692	—	930	21	4·5	10	Has verandahs on one side. Faces north and south.
	7		25	18	17·5				21	4·5	10	
	4		18	15	17·5				2	4·5	10	
	8		19	18	17·5				28	4·5	10	
Double Quarters	8	2	25	18	17·5	119,280	—	1,719	38	4·5	10	
	2		18	15	17·5				2	4·5	10	
Guard Room	1	1	130	17·75	18	41,535	—	—	20	4	10	
Prison Cells	2	1	15	8	8	1,920						
	12		13·5	8	8	103·68						
	1		9·5	8	8	608						
	1		8	8	8	384						

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. With the exception of a few windows in the rooms for serjeants at the end of each barrack, the windows are on opposite sides, and are as numerous as is consistent with the due apportioning of space for cots. These open outwards into verandahs. There are verandahs on both sides of the barracks, 12 feet wide, with the exception of the east and west bomb-proof which are in the ramparts. They are not intended to be occupied as sleeping-apartments; but in the hot weather many of the men prefer taking their cots into the verandahs to remaining in the wards. All the doors are one-third panel and two-thirds venetian or jhilmils. 6. The latest pattern of soldier's cot consists of a round rod iron frame with a net work of flat hoop iron for the support of the bedding. They are 6 feet 9 inches long, 2 feet 9 inches broad, 1 foot 6 inches high, and weigh about 1 cwt. They are in every way unobjectionable. 7. Tents have a double fly or top, and single kanats or sides. They are made of stout cotton cloth. They measure 20 feet by 16, and can accommodate 16 men, giving each a superficial space of 20 feet. The kanats or sides are triced up in the hot weather so as to give the occupiers the benefit of any wind that may be blowing. When shut and with the side doors only open, each man would have about 120 cubic feet of air. 8. Ventilation is effected in the barracks by numerous doors from 12 to 13 feet high at about 6 feet apart all round the wards. These secure thorough lower ventilation, whilst above openings are left at the insertion of all the flooring beams to carry off the heated upper air. These arrangements, coupled with the great height of the wards, from 17 to 20 feet, are, in my opinion, quite sufficient to preserve purity of air by night as well as by day. As the hot winds of the upper provinces are rarely experienced in Bengal, thermantidotes and kus-kus tatties are not required in Calcutta. All the barracks have punkahs pulled by natives. 9. The barracks are constructed of the best burnt bricks, set in lime mortar; the roofs of solid brick, and concrete terrace. They are plastered and white-washed. The tents have been already described. The huts for native troops are built of mud and are thatched. 10. The floors are constructed of bricks on edge, covered with square chuna flags. The basement floors of all the barracks, with the exception of the bomb-proofs, are given up for mess-rooms, canteens, skittle alleys, &c. They are never used as sleeping-apartments. 11. As far as the barracks are concerned, it would be very difficult to suggest improvements in those of Fort William. In the Dalhousie and Queen's barracks the accommodation may be considered perfect. The construction and repairs of buildings are in the hands of the garrison engineer, with the exception of such as are not likely to cost more than 5*l.*, in which case the work is done by the barrack-master. Periodical repairs of buildings are annual or quadrennial according to the nature of the work. External white washing, painting, &c., belong to the latter, whilst the internal white washing of hospitals, barracks, privies, &c., is annual. Both are provided for in regularly framed estimates, which are entered in the year's budget. Occasional repairs and emergent work are done by the garrison engineer on the authority of the brigadier commanding, who can sanction work extending to 50*l.* 12. The rooms for lavatory purposes are placed at the extremities of the barracks on each story. They have stone floors with raised masonry stands for basins. The water flows off readily into the drains surrounding the building. Plunge baths are much wanted and are included in the plans for the water supply of the fort already alluded to.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	13. The barrack cook rooms are of the most primitive kind. There is an open hearth for roasting, with two sloping side walls, to support the spit, and the chulas or native fire places for boiling meat, &c., are merely two low masonry walls, having an iron grating built in a few inches from the top, on which the charcoal is laid, the ashes falling beneath. The pot rests on the top of the low walls. Generally these are closed both behind and in front, having an opening for the removal of ashes, and the admission of air. Water is supplied by native water carriers; and the drainage is carried into the ditch. Soldiers' linen is washed by the regimental dhobies or washermen, and is accomplished out of the fort. Sufficient dhobies are supplied to each company for this purpose, and when in hospital the patients are supplied with hospital clothing, which is kept clean and in a serviceable condition by the hospital washermen and tailors. 14. The new pattern privy is now being introduced into the fort. More than half the number requisite for the garrison have been built, and the rest are in course of construction. By this arrangement all solid filth is received into iron pans placed under the seats, and emptied into iron barrel carts, which are removed at night, and their contents discharged into the river. Urinals have hitherto been made of sheet iron painted. Enamelled and cast glass urinals have been proposed and will probably be obtained from England. 15. The greatest attention has been given to the proper ventilation of the new privies. A ventilator runs the whole length of the ridge of the roof, and the sides of the building have numerous windows. The barracks are lighted at night by oil lamps under the management of the commissariat department. One light is generally allowed in each room, staircase, passage, and privy. This method of lighting being considered defective, a project for lighting the fort with gas has been submitted to Government and approved of. The requisite works have been entered in the budget of 1860–61. 16. Open masonry catch drains run along the sides of the roads in the fort and around each barrack and building. These slope in the direction of the ramparts, where they are met by intercepting drains leading to wells opposite each of the gateways. The sewage falling into the wells is conducted by sewers leading under each gateway to the level of the main ditch, crossing which in open drains it is discharged into the cunette. The open barrack drains are a little more than 100 feet from the main drains. The drainage of the fort is bad, inasmuch as it requires manual labour and the constant attention of the conservancy department. The special sanitary fort committee have recommended a thorough revision of it, and have also proposed a plan to Government for this purpose. I think the bomb-proof barracks are damp, but none of the others in which the men are located at night are so. The fluid refuse of the barracks is swept off night and morning by the garrison sweepers and water carriers, with the aid also of a fire-engine. There is no doubt, however, that a large portion of this evaporates. Only such liquid refuse sinks into the subsoil as is thrown on the ground outside the drains. There are no cesspits in the fort; the cunette receiving as it does the whole of the sewage of the fort is to a certain degree a foul ditch; but being filled twice daily by the tide it is not nearly so offensive as it otherwise would be. 17. The roads of the fort are swept twice daily, and are also watered in the hot season. All the catch drains are washed and swept down twice daily. All refuse, manure, &c., is removed by the conservancy carts, and thrown into the river. 18. All underwood is removed, and also the lower branches of trees from the surface of the cantonment. The ramparts, with numerous outhouses, &c., interfere in a measure with the free circulation of air; but this does not affect the soldiers in their sleeping apartments, which are so raised as to be above the influence of any stagnation of air from this cause. 19. The garrison bazaar is well drained and ventilated, and is supplied with water in the same way as the barracks. It is supplied with a urinal, and the native shopkeepers and others are prevented from making any filth in it. There is a special establishment of water carriers and sweepers entertained for the purpose of preserving due cleanliness in the bazaar. It is kept scrupulously clean. There are no native houses in the immediate neighbourhood of the European troops in this circle. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Cattle are slaughtered at East Curriah, a suburb of Calcutta, about two miles east of the fort. The offal is always buried. The slaughter houses are too far distant to affect the health of the troops in any way. I have made inquiries of the natives residing in East Curriah, and they do not consider their vicinity to the slaughter houses as unwholesome. 21. The stables of the fort are at some distance, as no cattle are allowed to be kept in Fort William with the exception of those of the brigadier commanding. The horses of the Governor-General's body guard are lodged in fine airy masonry stables at Ballygunge, which is two miles east of the fort. These stables are furnished with approved means of light and ventilation; the dung is removed daily on carts. 22. When cavalry arrive in Calcutta on their way to other stations, the horses are picketed on the plain in the centre of the race course. They are arranged in lines of squadrons, and the men are encamped beside them. 23. The Queen's barrack provides accommodation for 120 married men, which would give separate rooms in the proportion of seven men per company for the present strength of the garrison. In addition to these the serjeants have separate rooms at the end of all the barracks.
Officers' Quarters.	1. Three ranges of barrack are given up for the use of the officers, viz.:— (1.) The staff barracks, which has 10 quarters for married officers. (2.) The rampart barracks, which has 11 quarters for field officers and married officers. (3.) The royal barrack (3-storied), having 28 quarters for unmarried officers. There are also five gateway houses which are occupied by the brigadier and senior staff officers. Extensive improvements are at the present time under execution.
IV. Health of the Troops.	1. The station, district surrounding it, and adjoining native population, are comparatively unhealthy. The mortality of troops garrisoning Fort William has been always high, though I am confident that a great reduction will take place when the sanitary arrangements now in progress are completed. [The fort is generally unhealthy.*] 2. The most prevalent diseases among the native population are fevers, cholera, dysentery, and small-pox. The usual sequelae of fevers and dysentery, viz., enlarged spleen and fatal diarrhœa, are remarkably prevalent.

* This reply and the subsequent replies within brackets are taken from another unsigned report on Fort William, received from Calcutta.

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	3. I attribute the prevalence of these diseases to,—rank, exuberant growth of jungle, filth, stagnant water, foul drains, bad drainage, unwholesome drinking water, and nuisances of various kinds. 4. The troops in garrison have been constantly changing during the last year. Her Majesty's 37th regiment came from Ceylon in 1857, and has lately arrived from Ghazeepore. The regiment was unhealthy on landing in India, and has suffered much since. At Calcutta they were attacked with cholera, and at Ghazeepore with fever, cholera, and dysentery. This regiment has lost 257 men in Bengal. The 37th regiment is a very unhealthy one, and a very large proportion of the men have enlarged spleen and liver. It is believed that the greater part of this disease was contracted in Ceylon. The 5th regiment of Fusiliers has lately arrived from Allahabad, where they enjoyed good health in the cold weather, but suffered much from fever and cholera in the hot season. The bomb-proof barracks are not quite so healthy as the others. This is owing to their being built on the ground, and to the lateral ventilation not being equal to that of the other barracks. Till lately also, the privies attached to them were an offensive nuisance. [The bomb proof barracks, as also the lower floors of all the others, are unhealthy. This is attributable to inefficient ventilation and the vapours from the drains.] 5. The troops in garrison are never camped out, but troops arriving at or leaving Calcutta, are frequently lodged temporarily in tents pitched on the glacis of Fort William during the cold season. 6. I have never been on the hills; but from an examination of those who have had large experience of hill stations, I have arrived at the conclusion that the climate is beneficial to the weak and to men suffering from functional disease, but useless or even hurtful in organic disease. The climate is believed to be prejudicial in inflammatory disease, in continued and remittent fevers, in gout, and rheumatism, dysentery, diarrhœa, and cerebral affections, also in syphilis, and in cachexia. 7. I am of opinion that troops returning to the plains from a hill climate, are not more liable to febrile and other diseases, than those located on the plains, if proper care be taken to avoid all great and sudden changes, and to insist on the troops wearing flannel. 8. To the healthy the climate of the hills is invigorating, after the relaxing and oppressive heat of the plains, and impending attacks of disease are generally warded off by the prophylactic agency of a hill climate. In the plains there is a tendency to the impairment of the muscular and nervous energy, and the general tone of the system is lowered. On the hills the healthy and temperate would seem to enjoy vigorous health. With proper precautions, therefore, I entirely approve of selecting hill stations for troops. [I approve of hill stations for troops.] 9. At Kussowlee, Subathoo, Simla, and Dugshai, the troops are liable to an obstinate and troublesome form of diarrhœa, called the "White purging," which often causes serious losses in regiments stationed at those places. Epidemics of croup and diptheria occur in the higher ranges. The natives suffer much from hill colic, and are sometimes visited by the mahanurree, a malignant fever of a typhus character accompanied by external glandular swellings. [Troops at hill stations are liable to be attacked with diarrhœa and lung affections.] 10. I understand that every precaution is taken with troops in hill stations. Flannel belts are worn; the men are kept from exposure to wet and from the use of improper articles of diet, and are encouraged in athletic exercises, and in healthy recreations. 11. From October to June [from October to July] is said to be the best season for residence in hill stations; but to obtain the full benefit of the climate for sick and convalescents, two cold seasons are recommended, or from October of one year to March of the next. Troops should reside in hill stations for not less than one year, in order to obtain full benefit to their health; but the period of such residence must, of course, depend very much on the nature of the ailment. 12. I am not aware that any period of residence on the hills is injurious to the health of troops, on their return to service in the plains. 13. On leaving hill stations the troops should descend to the plains gradually, halting for two or three days half-way down. Great care should be taken to prevent the men throwing off their warm clothing suddenly, or drinking cold water when heated. The use of flannel is also to be insisted on. [Light clothing, avoiding exposure to the sun, and temperance above all.] 14. I am of opinion that it would be more conducive to the health of troops serving in India to locate them on hill stations with short periods of service in the plains. The longer they enjoy the invigorating influence of a hill climate, and the less they are exposed to the debilitating effects of the plains, the better. Frequent change of station is liked by the troops, and they generally enjoy good health on the march in cold weather, if not harassed by forced marches, nor allowed to stray in villages on the route for drink, &c. As far as health is concerned, change of station depends very much upon the salubrity or otherwise of the places to which they are removed. [The course most conducive to the preservation of health would be to locate them on the hills, only bringing them to the plains during the cool season.] [Frequent change of station in the plains is beneficial if the change is effected during the cool season.] 15. I understand that the barrack and hospital accommodation provided at hill stations is amply sufficient for the health and comfort of the troops. 16. Experience shows that the ranges of elevation most suitable as sites for hill stations are from 4,000 to 8,000 feet above the level of the sea, if removed from sources of miasmata, possessing good natural drainage, thorough ventilation, space, and freedom from local causes of disease. 17. The Rajmahal hills are about 130 miles from Calcutta; but their elevation is insufficient for the formation of sanitaria. They are also covered with jungle, and are said to be deficient in water supply. 18. Low, marshy places, ground subject to inundation and saturated with moisture as in many places in lower Bengal; rich soils, the upper part of which is composed of leaves and other vegetable matters undergoing decay, and tenacious clays which prevent water passing through them, are the most unhealthy class of soils for the formation of stations. [Sandy or metallic soils are more healthy for stations than others, as Meerut, Umballa, Ferozepore, &c.]

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	19. I should say from 18 to 23 years is the best age for soldiers proceeding to India, and they should land there in October or November, as it gives them the benefit of the cold season, and gradually introduces them to the hot one. Leaving England in July or August there is a gradual transition from the cool temperature of England to the heated atmosphere of India. Drafts for Her Majesty's corps go to Dum-Dum on landing, and those for the Indian Army to Barrackpore. They have excellent barracks at both those places, and are under instruction during their detention. They are sent up the country either by the river steamers or by bullock train. Personal cleanliness, temperance, exercise morning and evening, the careful prevention of exposure to the sun, and occupation of mind when confined to barracks during the day, are the precautions to be observed by the recruit on first landing in India. [22 years of age. Should arrive from November to March.] [Drafts are now detained in Calcutta only till such time as arrangements are completed for dispatching them to their destination. The necessary precautions on arriving in India are to avoid exposure to the sun, abstinence from spirits, moderate use of animal food, and not too much drill.]
	20. If drilled at home, and sent to India at the proper season, I feel certain that the proportion of sickness amongst the recruits on landing in this country would be greatly reduced. Gradual acclimatisation by short residence in an intermediate station would be advantageous. I think it would tend to reduce disease if troops on landing here were sent to a good hill station during the first hot season. The most stringent measures should be adopted to restrain intemperance, the use of crude fruit and vegetables, and to prevent undue exposure to the sun, and excessive physical exertion. [Troops should be sent to hill stations on first arrival.]
	21. Troops are transported from the fort to the interior by large, airy troop boats towed by steamers, and by bullock train. In the former the space provided for each European soldier, woman, or two children, is not to be less than 6 feet by 2. Separate hospital accommodation is provided for every detachment of 50 men and upwards. These boats have venetianed windows extending down both sides, and separated from each other by only a few inches of wooden post. The bullock train is composed of covered carts and waggons drawn by bullocks, four men being allotted to each cart and six to a waggon. These start from Ranegunge, to which place troops are conveyed by rail. Doolies are also supplied for men who may be taken sick on the journey, and there are road hospitals, with a medical officer, &c., attached to each, at short distances all the way up to Allahabad. [They are mostly sent up country by bullock train.]
	22. The number of years a British soldier should serve in India depends upon constitution, habits, idiosyncracy, &c. I have seen many soldiers whose constitutions were quite worn out by the climate after 15 or 16 years service, and I have known others who were active, apparently healthy, and quite fit for further effective service after double that period of residence in India. He would serve longer if allowed a furlough to England for 2 years, after 8 or 10 years [ten years] service in India.
	23. Difference of opinion will sometimes occur at invaliding boards, but in such cases the votes of the majority decide the question. [The majority decide in particular cases.]
	24. Invalids should never be allowed to quit India before January, in order to avoid the chill piercing winds of March in England. [November till February.]
Diseases.	1. There is always a surgeon's weekly inspection parade at this station for the discovery of incipient diseases.
	2. The admissions into hospital from scurvy are almost exclusively of seamen from merchant ships. On the arrival of the British troops during the mutinies, a small proportion of the soldiers was admitted from scorbutus, which was attributed to an insufficient supply of hermetically closed fresh provisions. This disease is attributable to overcrowding, and a diet which is deficient in the variety and quantity of the principles essential to the healthy constitution of the blood. We have numerous examples which establish the fact that this disease does not occur in well ventilated ships, when the troops are supplied with untainted recently salted meat, fresh biscuits, sufficiently hermetically sealed provisions, milk, potatoes, and lime juice, with fresh fruit and vegetables when procurable.
	3. In the general hospital the proportion of hepatic disease to total sick is about 9 per cent. Hepatic disease in this country may be caused by exposure to heat, to sudden atmospheric changes, and by indulgence to excess in spirituous liquors. Fatty degeneration and abscess are frequently found in cases of chronic dysentery. The frequency of this disease would be lessened by temperance, and by making the men wear flannel and flannel belts. [In India hepatic disease bears a very large proportion in comparison with any other class of disease, and is attributable to climate and mode of life. The means of warding off this disease are moderation in the use of articles of diet containing hydro-carbonaceous elements, avoiding exposure to the sun, cleanliness, mental amusement, and exercise.]
	4. I know of no well authenticated instance of dracunculus having been generated in this neighbourhood. Cases of this disease are sometimes admitted into the general hospital at the Presidency; but the worm is always mature, and most of the patients are sailors from Bombay. Its mode of entrance into the human body, and its subsequent propagation are involved in obscurity. [Europeans are rarely attacked by dracunculus.]
	5. The proportion of constantly sick from venereal disease to total sick in hospital is about 5 per cent. This disease might be lessened by keeping the men to their own bazaar and having frequent inspections of the women. The latter ought to be separated, and kept from all communication with the men when diseased.
	6. The following are the diseases from which the men at this station suffer, viz.:—
	Fevers.—Intermittent (of the quotidian, tertian, quartan, and double tertian types) the remittent and continued fevers. [Yes.]
	Dysentery.—Acute and chronic, with various complications. [Yes.]
	Cholera.—Bilious and spasmodic. [Yes.]
	Small-pox.—Benign and confluent. [Occasionally only.]
	Rheumatism.—Acute and chronic. [Yes.]
	The admissions from the above diseases are from 60 to 65 per cent. on the total sick, and the deaths are from 75 to 80 per cent. on the total deaths.

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	7. The following is a statement showing the nosological character of the more frequent zymotic diseases :—

Diseases arising from depressing causes characterised at their commencement by impaired vital or organic nervous force, but generally followed by more or less re-action throughout the frame, but often more prominently expressed in one or more organs.	Periodical fevers :— Intermittent and remittent, continued, and variola.
Pestilences appearing epidemically	Cholera.
Diseases characterised by an unnatural state of excitement or irritation of an organ or part, followed by morbid exudations, by changes of vital power, and of organization of the affected part.	Dysentery, hepatitis, splenitis, &c.

Variola is most prevalent in February, March, and April; fever in September and October; dysentery in July, August, and September; and cholera in March. The advent of the hot weather, the change from cold to heat, the extreme humidity, the drying up of the country after the rains, and increased generation of malaria, are amongst the climatic and atmospheric conditions which precede or accompany the above diseases. The barracks for Europeans are generally kept very clean; but the neighbourhood of native dwellings is almost always filthy. In fact, a large proportion of the natives die of disease brought on by inattention to the most obvious sanitary rules. The greatest attention is paid to the sanitary condition of the barracks, and every exertion is made to remove all endemic sources of disease. Amongst the troops the great predisposing causes to disease, are exposure and drink. The natives are temperate and their personal habits are not generally provocative of disease. [Hepatitis, febris, cynanche, dysenteria, diarrhœa, cholera, during the hot and rainy seasons.]

[The barracks and fort altogether are kept remarkably clean, but the drainage is bad, the water supply not so good as it might be, and the ventilation defective. The cooly bazaar, in the immediate neighbourhood of the fort, is foul and filthy to a very great degree. The drainage is most imperfect, and the bazaar is crowded with native huts.]

[The conditions which predispose to zyomtic diseases here are overcrowding, bad ventilation, foul air, and bad food.]

8. European and native troops suffer from frequent and long-continued exertions in the field, from forced marches, and exposure to the sun, but with proper care and management, the duties of a soldier do not, in my opinion, predispose to epidemic disease in Fort William. [Predisposition produced by long continued exertion, producing great fatigue and depression. Idleness and dissipated habits.]

9. Small doses of quinine have not, that I am aware, been tried as a prophylactic against malarial disease. To those predisposed to malarial disease, I am of opinion that it would act as a prophylactic; but I fear that the system would soon get accustomed to it, and that its effects would cease, or require greater doses.

10. To prevent or mitigate epidemic disease, I would recommend the careful avoidance of predisposing causes, as overcrowding, unwholesome food, unripe fruit, bad water, drunkenness, exposure to the sun, want of cleanliness, physical and mental depression, sleeping out at nights in the bazaars, &c. [A good supply of water, free ventilation, improved drainage, and a free use of disinfectants, and the immediate removal of the contents of latrines and cesspools. Active employment for body and mind.]

1. The troops at this station are about as temperate as those at other stations. With means and opportunity, many soldiers in most regiments will indulge too freely in spirituous liquors. The officer commanding H. M. 8th regiment reports 7 trials in 3 months for habitual drunkenness in his regiment; the officer commanding the 5th Fusiliers about 2 per cent., but the average number of drunkards to strength in European regiments in this country cannot be less than 15 per cent.

2. The surgeon of H. M. 8th regiment stated that the admissions into his hospital during the last year from diseases caused *directly* by intemperance was in the proportion of 1 to 114, and indirectly from the same cause 1 to 11. The surgeon of H. M. 5th Fusiliers gives 2 per cent. of direct admissions from intemperance, and 17 per cent. indirect. In 7 regiments serving in Madras during 1849, there were punished :

	Strength.	Punished per 1,000.
Teetotallers	671	236·95
Temperate	6,611	587·20
Intemperate	1,461	1709·78

Total ratios of sickness and deaths in the above 3 classes during the same year in six European regiments in Madras :—

	Strength.	Admissions per 1,000.	Deaths.
Teetotallers	450	1308·88	11·11
Temperate	4,318	1415·93	23·15
Intemperate	942	2148·61	44·58

Drunkenness is always punished as an offence.

3. Spirits are sold in all regimental canteens. Rum of 24 under proof, and of good quality, is supplied to the men. In H. M.'s 8th regiment, the daily consumption per man is $1\frac{4}{51}$ drams, in H. M.'s 5th Fusiliers $1\frac{1}{2}$ drams. Spirit does not form part of a soldier's ration, but is supplied by the commissariat, and paid for by the soldier. The issue of rum before dinner is prohibited. Porter and beer are supplied at dinner time to those who desire it. Before breakfast, neither spirits nor fermented liquors are permitted to be issued. Spirit is never given as a ration to convalescents. Ginger beer and coffee are sold by dealers in those articles in the barracks, who obtain a pass for this purpose. When out in the town, the men often partake of intoxicating drinks, which are very injurious to health.

4. To men in health spirits are, in my opinion, decidedly injurious in this country. There are some conditions of the body in which the circulation is sluggish, and the nervous system weak and depressed, in which small quantities may be useful. They are the curse of the European soldier in India, causing an amount of moral evils and of physical ills, the magnitude of which would render any attempt to lessen their consumption by the army worthy of our sincerest admiration and support.

5. I think it would be most beneficial to restrict the sale of spirituous liquors to moderate quantities. The reports of the American temperance societies show that 1,000 ships sailed from the ports of that country without ardent spirits as a part of their provision, and the men on board

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	were proved to be better able to undergo the fatigues and hardships of the sea, than those in vessels where the old plan was persevered in. It is also well known that the American insurance societies insure vessels which do not carry spirits 5 per cent. lower than others. The use and abuse of spirits cannot be abolished in the army, but every exertion should be made to prevent intemperance; which is not only the bane of the soldier in this country, but a dreadful expense to the State. 6. Beer in moderation is generally considered nourishing and wholesome in this country. It is greatly preferable to spirituous liquors. 7. Tea, coffee, lemonade, soda water, &c., are used in considerable quantities in Fort William, and I have no doubt that their influence on health, efficiency, and discipline, is most beneficial when properly made as compared with spirits. 8. I think it would be beneficial to the health of the troops to suppress altogether the spirit ration, and to substitute for it beer, tea, or coffee, &c., at the option of the soldier. Not only are the direct fatal results of drink painfully numerous, but it exerts in a considerable number of instances a marked influence in predisposing to other diseases. Habits of intemperance also by undermining the constitution render them, in many instances, incapable of resisting the destructive tendency of these other diseases. 9. I am convinced that it would be most beneficial to prohibit the sale of spirituous liquors in the canteens, allowing each man a ration of beer instead. This arrangement may induce the intemperate to resort to the bazaar for bad and unwholesome liquor, but stringent measures must be adopted to keep the men inside the fort, to prevent the introduction of spirit, and to suppress its sale in the bazaars. 10. Every means should be adopted to exterminate this bad habit in the soldier, such as the diffusion of knowledge, and the production of a taste for pleasures of an intellectual kind, and the occupation of his leisure hours by amusing pursuits, &c., &c. 11. There are no regulations on the above subject in the Fort William regimental canteens, but the following rules have been established for all regimental canteens in India. 1. Each regiment is to have a canteen which is to be managed by a quarterly committee composed of a captain and two subalterns of not less than 3 years' service, under the control of the commanding officer. 2. A steady non-commissioned officer is to be appointed by the commanding officer as canteen serjeant. 3. The establishment consists of 1 canteen sergeant, at 50 rupees per mensem; 1 assistant, at 16 rs.; 1 native writer, at 12 rupees, with the number of native servants considered necessary. 4. A sub-committee of non-commissioned officers is to be appointed to act under the quarterly committee, for the more immediate superintendence of the general management of the canteen, but to have no concern in any money payment or contract. 5. Detachments when practicable, are to establish canteens. If impracticable, malt liquor or rum will be supplied daily by the commissariat agent, on requisition, and issued under the orders of the commanding officer in the presence of an officer. 6. It is very desirable that coffee should be available for the men early in the morning, both on the march and when stationary. The committee should secure a contractor who would engage to supply coffee at a fixed rate. 7. Malt liquor and rum are supplied to canteens by the commissariat, and are retailed under regimental regulations. Rum is issued at 2 rs. a gallon, 24 per cent. under London proof, and retailed to the men at 1 anna per dram. 8. The difference between the original price of the rum, and that at which it is issued, viz., 8 annas per gallon, forms the canteen fund from which the authorized establishment and charges are defrayed. 9. The accounts of this fund are kept by the canteen committee. 10. Malt liquor is issued at rs. 40·2 per hogshead, and retailed to the men at 3 annas per quart, and 6 pice per pint. 11. The maximum quantities that can be issued daily are 2 drams of rum, or 1 quart of beer and 1 dram of rum. 12. No spirits are to be issued before the men's dinner hour, nor are the 2 drams of rum per diem to be issued at the same time.
VI. Diet.	1. The ration for Queen's British troops and European troops in the Indian army is the same, and is composed as follows, viz.:—1 lb. bread, 1 lb. meat, 1 lb. vegetables, 4 oz. rice, 2½ oz. sugar, ½th of an oz. of tea, 1 oz. salt, and 3 lbs. firewood. Mutton, when procurable, is issued twice a week in lieu of beef, and coffee may be substituted for tea, at the desire of the soldier, in the proportion of 2 lbs. of the former, to 1 lb. of the latter. The vegetables are generally potatoes in this circle, but when these are not procurable country vegetables of good quality are substituted. The rations are always of good quality, wholesome, and plentiful. Rations are daily inspected by the regimental officer of the day, and by the regimental quartermaster. 2. The troops are provided with a complete ration daily, with a due proportion of vegetables. The stoppage is about 5*d*. The soldier has 3 meals per diem, viz., breakfast at 8 a.m., dinner at 1 p.m., and supper at 6 p.m., one pound of vegetable enters into the constitution of each ration. 3. In cantonments in the hot weather I am of opinion that the meat ration might be beneficially reduced to three-quarters of a pound. So much highly carbonized material is not required by the system at that season, and tends to the production of fatty degeneration of the liver, kidneys, and heart. The system of messing would seem to prevent the disposal of any part of the ration by the troops. 4. The means and apparatus for cooking available at this station have been described (29, 13, sanitary condition of the station). Grant's cooking stove has been recommended for use in the barracks, and I have no doubt that it will be found most effective and convenient. It has also been approved of for hospitals by the special hospital committee, as per plan transmitted. The kitchens are clean and well ventilated. The regimental water carriers always supply a sufficiency of water. The food is sometimes boiled, sometimes roasted, and the cooking is generally good and sufficiently varied. The tea is generally boiled instead of being infused; but the men prefer the former mode of preparing this beverage. It is generally the custom to have coffee prepared for the men on the line of march. They very rarely have tea, coffee, or other

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References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	refreshment before a march, which is generally made very early in the morning, so as to reach the encamping ground before the sun has risen so high as to be troublesome or dangerous. 5. Gardens for the cultivation of vegetables by soldiers could be advantageously established at the distance of a mile or two from the fort, but not in its immediate neighbourhood. Very stringent regulations would, however, be required to prevent the men wandering into the bazaar for drink, &c.
VII. Dress, Accoutrements, and Duties.	1. In the cold season the soldier's dress and accoutrements are the same as in England. For the hot season he is provided with cotton tunic and trowsers, a forage cap and cover. The present dress of the soldier is very suitable to the climate, and for his duties by day and by night, at the different seasons of the year. The protection for men on guard during wet is the great coat. The summer coat is made of a slate-coloured khakee, worn loose. A light handkerchief has been substituted for the stock. The men are supplied with 2 pairs of boots and 2 pairs of socks, and 2 cotton cap covers with flaps, which protect the neck and temples from the sun. Flannel is indispensable as an article of upper clothing in this country; but it should be frequently washed, or it becomes a source of disease. The soldier ought to have two flannel shirts at least.
Duties.	1. There is no doubt that it would be most advantageous to have the men thoroughly instructed in drill before coming to India. 2. The usual routine of soldier's duties is, parades for drill and exercise, and mounting guard. Drill is very seldom continued for more than 1 hour, and the men do not seem to suffer in health from it. The best time in this country for drills, parades, &c., is in the morning, half an hour before sunrise. At present the European troops in garrison have 5 nights in bed for 1 on duty. 3. Guards mount close to the barracks, and last 24 hours. There are more or less frequent roll calls by day, and by night, according as the men are absent without leave from the barracks. I am of opinion that night guards tend to increase sickness.
VIII. Instruction and Recreation.	1. The following are the means of instruction and recreation at this station:—1 ball court, 4 skittle alleys in use, and 4 others nearly finished, 2 regimental schools with schoolmasters, also a garrison school; a large library just opened for the use of the garrison, besides regimental libraries, and a library for the use of the non-commissioned staff. There are neither day rooms, soldiers' clubs, soldiers' gardens, or workshops, but, with respect to the latter, the matter has been under consideration. A theatre has been lately constructed in the barracks for the use of the men, and a gymnasium has been lately provided by order of Government. In addition to the above, cricket, foot-ball, and quoits are played morning and evening. I think the men have now the means of recreation during the wet season and heat of the day, and there is every reason to hope that these will afford them full occupation. The men are not allowed to leave barracks during the heat of the day, and there is no doubt that this restriction is a matter of necessity in this country. 2. I am of opinion that the means of recreation and employment at present in operation in addition to such as are in contemplation will be found sufficient for such soldiers as are willing to take advantage of the same. 3. The institution of soldiers' savings banks is decidedly most advantageous. They have lately been established throughout the country. 4. The ground floors of the barracks and the verandahs afford ample space for recreation and exercise during the heat of the day.
IX. Military Prisons.	1. The solitary cells are objectionable on account of their contracted dimensions and imperfect ventilation. The Fort William special committee have the subject under consideration at present, and propose to concentrate the whole of the cells of the fort in a single building, so as to diminish as far as possible the demands for guards over prisoners.
X. Field Service.	1. When proceeding on field service, medical officers are instructed to accompany their regiments in the rear into action, furnished with all instruments, dressings, and necessaries requisite for field duties; to protect their establishments by their presence; not to remain unnecessarily under fire; to select a suitable and safe spot adjacent to their regiments for the wounded, and to send in lists of casualties in killed and wounded immediately after any encounter with the enemy. 2. The recommendations and objections of medical officers as regards the conduct of the line of march of troops, bivouacking, camping, &c. are generally attended to unless weightier reasons forbid. The practical working of the power of medical officers in all such cases is always most beneficial. 3. Permanent encamping grounds planted with trees, exist along all the principal roads in this country, and the most careful attention of all medical officers is required to the application of the generally established rules relating to health and conservancy, under all the varying conditions to which the troops under their charge may be exposed. The existing arrangements on the line of march are excellent and have proved efficient. The special hospital committee have recommended the establishment of completely equipped hospitals at all the larger stations in India. 4. When an army goes into the field a field general hospital is established quite independent of regimental hospital establishments. To this are appointed a field surgeon, a medical storekeeper, assistant surgeons, an apothecary, steward, assistant stewards and apothecaries, and apprentices according to the strength of the army employed. It is also supplied with native head compounders, assistant compounders, head dressers, assistant dressers, shop coolies in the apothecary's department, and native writers, stewards, servants, bheesties or water carriers, sweepers, ward coolies, cooks, washermen, a clothier, tailors, and barbers in the steward's department. Tents are furnished at the rate of 8 patients per tent; necessary tents, serjeants' tents for subordinate establishment, tents for stores, &c., camels and elephants for the carriage of tents, and native tent pitchers or clashis; hospital clothing, hospital cots, and hackeries for the carriage of the same. The doolies and bearers for every 100 patients are, 100 doolies, 6 scidars, 12 mates, and 600 bearers. European medicines, wines, stationery, cloth for bandages, and dressing are provided, and also cooking utensils, and charpoys for natives, &c. The sick and wounded are transported in doolies, which are comfortable and easy, and admirably suited to the country. The hospital supplies are carried by elephants, camels, hackeries, and banghy-wallahs.

References to Subjects and Queries.	Replies.
XI. Statistics of Sickness and Mortality. XII. Hospitals.	No information under this head. 1. Ground plan and elevation of the hospital transmitted herewith. 2. The hospital is situated at Bhowanipoor, about three-quarters of a mile S.S.E. of Fort William. The nearest stables are those of the body guard at Ballygunge, about 1¼ miles east of the hospital. The hospital is bounded on the east by a native bazaar, on the south by native houses and the European lunatic asylum, on the west by a road which divides it from the compound of the Sudder Dewanny Adawlut, and on the north by an open plain continuous with the glacis of Fort William. The site is open to the north and west, but surrounded by buildings, walls, and trees, to the south and east. As most of the walls and buildings are low they interfere but little with the ventilation, save that in the lower story which in both wings is used as godowns. The site is healthy for Calcutta, though it is not elevated above the general level. The drainage is bad; but the drains being open and swept out most carefully morning and evening, I am of opinion that no ill consequences result therefrom. An open ditch to the east of the hospital which carries off a large portion of the sewage of the great jail and of the hospital has been reported a nuisance by me, and by the surgeon of the general hospital. 3. The water supply is abundant and wholesome. It is obtained from a tank in the hospital compound, measuring 192 by 126 feet, and 30 feet in depth. 4. The drains are all open surface drains, made of masonry, and most of them lined with large tiles. About 100 yards from the hospital buildings the drains discharge themselves to the east into the ditch already referred to, and to the west into a large pucka drain, both of which convey the sewage to Tulley's nullah, a large canal which empties itself into the river. 5. The lowest wards in the right and left wing hospitals are raised 12½ feet above the ground, the ground floor of both buildings being occupied as store rooms. There is consequently free perflation of air under the floors. The roof water is carried off by the drains, and none of it sinks into the subsoil within the hospital grounds. The drains and guttering are sufficient to carry off the heaviest rain fall; water lodges in several places when the drains are nearly empty, and this requires to be swept out; having but little fall the drainage is not rapid. The walls of the hospital are of brick and mortar, 3 feet thick in the centre. The centre ward has a double verandah to the south, and a single closed verandah to the north, but neither roofs nor walls are double. The roofs are flat and of thick tiles covered with masonry. They are sufficiently thick to keep the hospital cool. There is an open verandah to the south, supported on pillars and arches, and an inner verandah with same aspect, having broad arches on one side, and venetians and glass doors on the other side. There is a verandah similar to the last to the north of both the wing hospitals. The inner closed verandah to the south of the wing hospitals is frequently used for the accommodation of sick. The outer open verandahs are only employed as a promenade or for the patients to sit in. The centre hospital consists of two flats, and the wing hospitals of three flats each.

Table of Hospital Accommodation.

Date of construction, 1795.

Total regulation number of beds, 420.

Wards or Hospital Huts.	Regulation No. of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
Centre Building.											
Total Number of Wards - 12.											
" " Beds - 120.											
Centre	1	49	25·5	18	97,821	1,630	181	—	16	10	5
Sides	2	49	20·5	18					2	10	4
Front	1	62	20	18					10	10	5
Sides	2	26	18	18					18	10	6
Eastern Building.											
Total Number of Wards, 16 large and 4 small.											
Total Number of Beds - - 150.											
Centre	1	140·5	17·75	12	29,925	927	78	—	26	8	4
1st side	1	140·5	10·5	12	17,706				12	8	4
2nd side	6	22·25	10·5	12	16,824				18	8	4
Smaller ward for eye cases	2	23·5	9	12	5,076				6	8	4
Western Building.											
Total Number of Wards - 10.											
In each story.											
Centre	1	147·5	17·75	12	32,748	977	81	—	26	10	5·5
1st side	6	22·25	10·5	12	16,824				12	8	4
2nd side	1	147·5	10·5	12	18,588				12	10	5·5
Wards for eye cases	2	23·5	9	12	5,076				6	8	4

N.B.—The dimensions in the above Table are of the first stories or flats of the wings; the second stories are precisely similar, except in height, which is 15 feet.

The hospital faces the north, and has the full benefit of the prevailing winds. The side windows are so large and numerous, that the patients may be said to live in the open air, under a roof to protect them from the sun's rays. The venetianed windows open outwards and turn back against the walls, the glass doors fold inwards. When open there is no impediment to ventilation in the entire space included in the window frame. In fact the windows are large doors opening with a few exceptions to the floors of the wards.

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References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	6. I have been in this hospital when it contained 460 patients, yet the wards were perfectly free from odour and closeness. The lateral ventilation in this building appears to me to be most effective in allowing a constant current of air through the wards. The jhilmils are broad slips of wood, which overlap each other, and can be raised or shut at pleasure. Each slip is furnished with a pivot at each end, which moves in a socket in the door frame. The jhilmils are in the usual place of panels in a door. 7. Tatties are not considered wholesome in Bengal, and are not employed in the general hospital. Punkahs are supplied for military patients, but these merely circulate the air and do not cool it. 8. The wards never require to be warmed. The walls and ceilings of the wards are cleansed and whitewashed once yearly, but in most hospitals this is done when certified by the medical officer to be necessary. 9. The privies are connected with the wards by a covered passage 61 feet in length, and 10 feet in breadth. These are airy rooms in which close stools are placed, the pans of which are removed by sweepers immediately after the patient's resort to them, unless otherwise ordered. They are all furnished with separate stairs for the sweepers and water carriers. The privies are well drained and supplied with water; they are not placed over cesspits, which are very objectionable in this country. They are never offensive with proper care. All the filth is removed to the river by means of carts, which receives the contents of the stool pans during the day, and carry it off at night. 10. The general and garrison European hospitals are supplied with hot baths, wash rooms with shelves for basins, and bath rooms on the common country plans, the water being poured over the body from native earthen pots; shower baths have also been recommended. 11. There are hot and cold baths in each wing built of masonry, also the ordinary country bathing room, in which the sick can bathe by having vessels of water poured over them. 12. There is a tank of water in the compound of the general hospital for the use of washermen, who are also supplied with all the requirements for washing, steaming, and drying hospital clothing. 13. The store rooms are sufficiently commodious for the number of sick in the general hospital, but it has been found insufficient during the last 2 years, in consequence of the large quantities of clothing handed over by troops proceeding to England, and by invalids from the upper provinces. 14. The common wooden or iron cot is used in hospital. The first is a mere wooden frame on legs, the latter is preferable, and has been already described. The former has a cane bottom, the latter one of slips of iron. 15. The hospital kitchens, which are separated from the main buildings, and at a convenient distance from them, are supplied with ranges of chulas or the common native cooking places, and with an open fire-place for roasting meat. The chula is composed of 2 low walls of brick, on which the pots rest. 16. Copies of diet tables, &c., have been forwarded. 17. The regimental hospital has an hospital sergeant, and the general hospital 2 European ward masters, but the immediate attendants on the sick are the native ward coolies. It is however proposed to introduce female European nurses in the proportion of 1 to every 25 patients. The present attendance is sufficient, but that of the European nurses would be more grateful to the patients. 18. I consider the sanitary condition of the general hospital as good as circumstances will allow. Hospital gangrene is almost unknown in its wards, and pyœmia is quite as rare. I am not aware of a single case of either disease which originated in the ward. 19. The drainage of the hospitals is imperfect, and objections have been made to the wards being too low. I am of opinion that great height of wards is not so essentially necessary in a building, the lateral ventilation of which is so great that the patients may be said to live in the open air. 20. Accommodation for 32 men in bullock ambulances for the conveyance of convalescents out upon the plain every evening for exercise is provided. The men are allowed to take exercise in the verandahs in the day time, and on the top of the hospitals morning and evening. They can also walk about the grounds, and may sit under the shade of a fine banian tree, which is situated in front of the hospital. 21. There is a female hospital. It is detached and well raised, having flues below, but being surrounded at a short distance by other and higher buildings, it is not very airy. I am of opinion that the arrangements for the treatment of soldiers' sick wives and children are most satisfactory. 22. No reply to this query. 23. All requisitions from medical officers with regard to the sanitary state of the hospital and repairs of buildings obtain the immediate attention of the local authorities. The greatest latitude is allowed to medical officers in dieting the sick soldier, and in supplying him with medical comforts within his hospital, at stations, in camp, or on the march. 24. With regard to the accommodation of convalescents at this station, the soldier is generally kept in hospital till he can be reported fit for duty, or else sent to barracks with a recommendation that he be excused heavy duties for a day or two. Convalescent hospitals would be superfluous, as the regimental hospitals possess all requirements for the sick soldier in every stage of disease. For chronic diseases there are the convalescent depôts on the hills.
XIII. BURIAL OF THE DEAD.	1, 2. The burial ground used by British troops is at Bhowanipore, behind the general and garrison hospitals, and is about 2 miles S.E. of the fort. Its area is about 1,500 square feet, the soil being sandy, with a sand and sandy clay sub-soil. Decomposition takes place rapidly, but the drainage is imperfect. 3. The grave space allowed is 9 feet by 6 feet, the interval between each grave being 2 feet. The depth is 6 feet. Graves are re-opened for the interment of relatives, and each grave is supposed to be full after 4 interments. Such as are not considered family vaults are opened for interment after 3 or 4 years. The burial of the dead cannot be deferred long in this country, in consequence of the rapidity of decomposition. It generally takes place in from 12 to 24 hours after decease. The Mussulman troops are buried in the grave yard belonging to the sect in the neighbourhood, no special provision being made for the burial of native troops in this circle. Hindoos throw their dead into the river or burn their bodies.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	4. The grave yard is not offensive at ordinary times. During the mutinies when the mortality was great, and the water in Tully's nullah which runs to the south of the ground, ran very high, some of the graves were inundated and became offensive; but this was checked with lime, and no effluvia has been perceptible in the grave yard since that time. The funerals of deceased soldiers take place at sun rise or half an hour before sun set according to circumstances. The accumulation of rubbish in the grave yard is prohibited, and there are rules to ensure the ground being kept in proper order. 5. The dead of camp followers and bazaar people are disposed of in the manner already described for native troops. 6. In some few instances the Mussulman burying grounds have been proved to be nuisances, in consequence of the graves being shallow and liable to be broken into by jackals. The police, however, use every exertion to prevent this, though not always with success. 7. The present arrangements for the disposal of the dead seem unobjectionable as far as European troops are concerned. The Hindoo custom of throwing their dead into the river is a serious nuisance, but cannot be prevented without interfering with the religion and prejudices of the natives.

(Signed) James Anderson, M.D.,
Deputy Inspector-General Indian Army,
Presidency Circle.

FORT WILLIAM.—FURTHER REPORT.

*** The abstract of this report is limited to points not so fully illustrated in the preceding report on Fort William.

References to Subjects and Queries.	Replies.
I. Topography.	1. Fort William, which has a circumference of somewhat over 3 miles, is surrounded by an open esplanade, nowhere less than half a mile wide. The ground is perfectly flat, and covered with a good firm turf, which remains green throughout the year. Though not swampy, water lies everywhere close to the surface. Trees, with the exception of those in the botanical garden, north of the fort, are very sparingly scattered. As to general appearance, the view from the fort is bounded on three sides by the houses of the city, and on the other by the shipping in the river, with the suburb of Howrah on the opposite bank. Of water there is abundance in the neighbourhood,—Calcutta itself having, within its municipal limits, 1,043 tanks, with a total area of no less than $\frac{1}{25}$ of the area of the city. The river Hooghly, moreover, 2,000 feet wide, flows past the west face of the fort. 2. The height of Calcutta above the sea by the surveyor-general's barometrical measurements, is 18·16 feet, and distant 67 miles as the crow flies. The fort is built on the general level of the Gangetic delta, and consequently has no command of position over the adjacent country. The elevation of the enceinte above the Hooghly during high spring tides in the monsoon is exceedingly small, while during the dry season it is never less than 7 feet. The following table shows the heights of the river according to the state of the tide and season of the year, the numbers indicating the level of the river surface below the top of the bank in each case:—

State of Trade.	Dry Season.		Rainy Season.	
	Neaps.	Springs.	Neaps.	Springs.
	Feet.	Feet.	Feet.	Feet.
High Water -	15	$6\frac{3}{4}$	$8\frac{1}{4}$	$\frac{3}{4}$
Low Water -	$21\frac{1}{2}$	$22\frac{1}{4}$	$12\frac{3}{4}$	15

The Howrah, or right bank of the Hooghly, is slightly higher than the Calcutta side, and might probably from this circumstance, as well as its better position in regard to the prevailing winds, have proved more salubrious; no very determinate opinion, however, can be given regarding this. There is no higher ground within such a distance as would render a change of location desirable on sanitary grounds; but, even did such a position exist, a change would apparently be out of the question for political reasons.

3. The Rajmahal hills, the nearest to Fort William, are not less than 125 miles distant. A spur of these hills has been chosen as a sanitarium. Parasnauth is 190 miles distant, and 4,230 feet high.
4. In addition to the river, a tidal creek, called "Tulley's Nullah," joins the river at three-quarters of a mile south of the fort. An extensive swamp, known as the "Salt Water Lakes," lies to the north-east at about three and half miles, and a circular canal between that and the city. The situation of all these is indicated on the map of Calcutta which accompanies. The committee for drainage in Calcutta remarks "that the slope of the drains is so small in "the town, and the quantity of water which falls in a short time is so great, that the streets "are sometimes flooded, and it takes several hours for the water to flow off." Upwards of 11 inches of water fell on the 21st August 1844, and 10 inches on the 22nd October 1851, and from 3 to 4 inches seem not uncommonly to have fallen in 24 hours in August and other monsoon months. In such cases a good deal of water naturally remains on the ground, but it can hardly be doubted that within the fort itself the storm waters are carried off more quickly than in any part of the city. There is no natural hollow in or about the fort, in which water accumulates or becomes stagnant. The lunette, however, which surrounds the fort, and is filled and emptied with the tide, receives the whole of the sewage; from this circumstance, and the large deposit of silt that takes place annually, its effect on the health of the garrison is manifestly injurious. Strenuous efforts are now being made to mitigate, if not entirely cure, the evil.
5. The fort is not so open as might be wished, but still the large masses of buildings requisite for the garrison and arsenal have been disposed as judiciously as the available space admitted of. The height of the rampart surrounding the fort, 25 feet, of itself interferes with the circulation of air in a measure; but this obviously cannot be avoided. With the exception of a few trees to the southward, no vegetation in the enceinte within, interferes with

FORT WILLIAM. BENGAL.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	the circulation of air nor grows to any injurious extent. The reflection of the sun's rays from the numerous buildings in close proximity in the fort naturally raises the temperature, but the extent and airiness of the barracks, and the open esplanade on all sides, each and all tend to counteract this, so far as to make probably the fort equally cool with the coolest part of Calcutta. With the exception of the heavy squalls which occur towards evening in March, April, and May, the station cannot be said to be exposed to cold or variable winds. From October to January land winds from the north-west prevail, while during the rest of the year the wind has generally a south-easterly direction. The malarious exhalations driven over Fort William by the south and east winds from the salt lakes and from the immense tract of low and jungly country called the Sunderbunds are productive of unhealthiness. 6. The esplanade surrounding the fort is a grass sward. Beyond the Calcutta suburbs there is rice cultivation to the east and north, and thick jungle succeeded by cultivation on the south. There are no regular works of irrigation near this station as water for cultivation is easily obtained (from its nearness to the surface) from tanks and wells. None of the unhealthiness of Fort William has been referred to the rice and other cultivation, which, as before mentioned, exists beyond the town limits, malarious influences being justly attributed to the uncultivated marsh and jungle lands. Cultivation, as superseding these, must be held to exercise a beneficial influence. Neither indigo nor flax is cultivated in the adjacent country. 7. The mass of the native population occupy the portions of the city on the north and north-east of the fort, and again there is a considerable collection of natives along Tully's Nullah, Allipore, &c. Merchants, Government officers, &c. have their private residences to the east and south. The total population is estimated roughly at 450,000 souls. 8. With respect to the geological structure of the surface, subsoil, &c. of the station and surrounding district we have the following from the Drainage Committee's report already quoted.—"After penetrating through the artificial soil of the surface a light blue or slate-"coloured clay occurs, becoming darker as we descend, from impregnation with decayed "vegetable matters, until it passes into a stratum of black peat about 2 feet in thickness, at a "depth in Fort William of 50 feet below the surface." This general character seems to be preserved about the district. 9. In the dry season water seldom stands at less than 12 feet from the surface of the ground, and in the rainy season at 10 feet. 10. There are no surface springs. Rain-water partly flows off, partly soaks into the ground, falling to the levels above indicated, which would appear to be somewhat about the mean tide level in the river at the different seasons. The drainage of the fort is altogether uninfluenced by that of any neighbouring locality. 11. The whole of the water used for drinking, cooking, and by the Europeans in garrison is brought from the havildars' tank, which is a reservoir of about 300 feet long, 200 feet wide, varying from 12 feet deep in the hot season to 4 feet deep in the dry, and filled by the surface drainage of the esplanade. The natives of the garrison supply themselves partly from the tanks, and partly from wells within the fort. The water from the latter is brackish. In addition to the havildars' tank on the esplanade, there exist, within a limit of about half-a-mile from the Fort glacis, several large tanks, having in the aggregate a superficies of 1,000,000 square feet. These are, however, now exclusively used by the townspeople. No water is at present drawn from the river, but a project is being digested which it is hoped when carried into execution will amply suffice for all the wants of the garrison. By this plan water, filtered, will be pumped into the fort at the rate of 30 gallons per man per diem. In the monsoon the havildars' tank is generally full to overflowing, but towards the end of the dry season, from the quantity of water drawn from it, and evaporation, its level becomes considerably reduced. No person is permitted to bathe in the havildars' tank, neither does foul drainage find its way into it; but from the smallness of the depth of water it is found impossible to prevent vegetable matter from growing on the surface. This is, however, carefully and frequently removed. The main sources of malaria, Salt Water Lake, and the Sunderbund jungles already alluded to, are irremediable; but the nearer ones of bad sewerage and the cunette in which the mud deposits are exposed at each recession of the tide, and doubtless give off noxious gases, are quite within the range of our means of prevention, and, as already mentioned, the subject is receiving the closest attention, with a view to a complete rectification of the evil. 12. For drinking and cooking purposes the amount of water from the havildars' tank is barely sufficient. Bheesties are specially employed for bringing it into the fort. For the soldiers washing, for cleaning utensils in the cook-rooms, &c., the supply exclusively drawn from the cunette just suffices for absolute requirements, but no more. From the same source is also drawn the water used for washing down barracks and drains, for watering the roads, and flushing the sewers. A good water supply is the main desideratum of the fort, the present one barely sufficing the requirements of the garrison, admitting of no plunge baths for the men, nor any proper system of sewerage. The drinking water from the havildars' tank becomes quite clear and colourless after standing a short time, but retains, however, an earthy taste. The cunette water is quite unfit for drinking, as in its present state it receives the sewage of the fort, and holds in solution all kinds of impurities. The tank water is pronounced by the chemical examiner to Government to be remarkably pure and wholesome. This might be expected, from the fact of its being rain water stored up and secured from all contamination. The river water, which is extensively used by the population of Calcutta, is also considered wholesome. Its chemical composition, as determined by the late Mr. Piddington, is as follows:—245·3 grains of silt, 188·3 of carbonate of lime; total 433·6 of solid matter, or $\frac{6}{10}$ of an ounce for the whole solid contents of a cubic foot of water. In supplying this water as proposed, all silt and impurities will be got rid of as much as possible by filtration. The present water supply and conservancy establishments may be stated to consist nearly as follow:—Bheesties and mehter, with cost of supervision, 80*l.* per mensem; establishments for regiments in garrison, about 54*l.*; making a total, including cost of conservancy and water supply, of 134*l.* A slight variation always exists, as the allowance of water carriers, &c., is proportioned to the strength of regiments in garrison. That a better supply of water can be given to the fort will be gathered from the foregoing replies. The means proposed for filtration, raising, storage, and distribution, in the project now under consideration, it would be manifestly impossible here to detail. 13. No reply to this query. 14. The selection of sites for barracks, &c. is a matter to which every attention is now given under existing regulations. It is laid down in the Public Works Code, that committees,

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	which one, and in all practicable cases two, experienced medical officers must be members, shall be assembled in all cases in which it may be necessary to select sites for barracks, hospitals, and other buildings for troops, or when it may be necessary to report on their condition in a sanitary point of view. The following instructions leave nothing to be desired in respect to this most important matter.

Extract from Code of Regulations for the Public Works Department, Cap. VIII. Sect 2. Para. 1. Clause 3.

"The choice of a site for any building requires careful consideration on the part of the engineer; but when the building is designed as a residence, especially when for a large number of human beings, this point becomes one of the utmost importance. In the case of barracks, gaols, &c., the executive engineer must therefore carefully investigate the nature of the drainage for a considerable distance round the proposed site, particularly satisfying himself that the spot (and as far as possible the neighbourhood) is not liable to flood. He must examine the position of the neighbouring buildings, cultivation, tanks, jheels, jungles, and note the direction of the prevailing winds, and the character of the country over which they blow, and must, if possible, obtain the opinion of medical officers as to the salubrity of the site, with reference to these and all other circumstances. The aspect of the buildings must also be determined, with reference to the prevailing winds and other circumstances."

II. Climate.

1, 2. *Vide* preceding report.

3. The atmosphere at the commencement of the year is generally dry and cool; it gradually, however, becomes warm towards April, from which time, during the prevalence of the south-east winds, a very sensible change takes place, the air becoming charged with moisture, and being at times extremely oppressive. This state of things prevails up to the middle of October, when the cold weather may be said to commence. The nights in December are frequently so cold as to render fires pleasant. In March and April, dust storms, followed by thunder, lightning, and rain, are not unfrequent towards evening. Abundance of dust is generally flying about during the hot weather, which further than being peculiarly disagreeable, is not supposed to be injurious. Heavy fogs prevail all over the Gangetic delta from the end of November to the end of January. Though the climate can by no means be said to be variable, cold blasts of wind frequently precede the thunder storms, which occur, as above stated, in March and April. It is also uninfluenced by tree planting or works of irrigation. The troops suffer from the relaxing effects of the damp climate during the prevalence of the south-east winds. The cold weather, unlike that of the north-west provinces, is not sufficiently bracing to set men up for the ensuing hot season. The influence of climate on the food, clothing, and shelter of men offers no peculiarity in Bengal. The precautions regarding drills, duties, and exercise are to keep men from over exposure to the sun, and too much work at one time. Duties are best performed in the early morning. The healthy months extend from November to March; the unhealthy ones being April, May, September, and October, during which the prevailing diseases are cholera, dysentery, and intermittent and remittent fevers.

4. No district exists near Fort William possessing a climate more conducive to health than that of this station.

5. The following are the stations at which the members of the committee have served:—

In Bengal proper: Fort William, Hazareebaugh, Barrackpore, Chinsurah, Purneah, Dinapore, Bhaugulpore, Tirhoot. In the north-western provinces: Cawnpore, Allyghur, Agra, Allahabad. In the Punjab: Meerut, Umballa, Lahore, and Peshawur. In Oude: Sultanpore. In Burmah: Moulmein, Thayetmew, and Pegu. In Madras: Madras and Mercara. In Central India: Kamptee and Banda. In Hymalayah: Darjeeling and Saybathoo; and in the Neilgherry Hills: Ootacamund. The simple expression of individual opinion as to the healthiness or unhealthiness of particular places not being altogether reliable, it is thought advisable to give a table of mortality compiled from Dr. Chever's articles "Health of Troops," published lately in the Indian Annals of Medical Science, which, while embracing nearly all the places mentioned by the Committee, is framed from the most authentic sources.

...BLE showing Per-centage of Deaths per 1,000 of Strength in the Three Presidencies.

Bombay Presidency.			Bengal Presidency.				Madras Presidency.		
From Jan. 1830 to Dec. 1849.	Strength.	Deaths to Strength per 1,000.	For the year 1846-47 to 1855-56 inclusive, H.M. and Hon. E. I. Company's Troops.	Average Strength.	Deaths to Strength per 1,000.	Remarks.	For 10 years from 1829 to 1838.	Aggregate Strength.	Deaths to Strength per 1,000.
Kolapore	292	20·54	Hoshiarpore	82	12·195	For 5 years.	Bangalore	15,590	28·03
Sholapore	1,213	23·90	Gobindghur	108	18·518	„ 7 „	Bellary	9,020	31·59
Kirkee	12,786	27·21	Mooltan	105	23·571	„ 6 „	Moulmein	9,092	37·39
Belgaum	15,101	27·54	Jullundur	930	29·032	—	Cannanore	7,959	37·69
Punjab army	2,485	28·97	Rawul Pindi	927	29·126	„ 7 „	Trinchinopoly	8,922	39·34
Aden	6,002	29·99	Sealkote	552	30·79	„ 6 „	Kamptee	9,574	39·37
Deesa	18,695	34·33	Benares	124	32·258	—	Fort St. George	13,981	42·91
Ahmednugger	7,380	34·55	Woozeerabad	1,552	34·794	„ 7 „	Arnee	2,699	31·86
Bhooj	1,511	38·38	Agra	838	35·800	—	Cuddalore and Arcot	1,551	56·7
Poona	37,967	41·19	Meerut	1,795	37·883	—	Do. do. Depôt of European Pensioners	2,269	98·61
Kurrack	1,256	43·78	Mean Meer	1,045	38·278	„ 6 „	Wallajabad	686	14·6
Mhow	503	49·70	Kussowlie	644	40·373	—	St. Thomas's Mount	1,721	27·89
Indus Army	1,303	73·67	Dugshai	816	42·892	„ 7 „	Poonamallee	5,182	24·12
Kurrachee	15,653	90·20	Umballa	1,753	45·991	—	Secunderabad	7,561	71·68
Bombay and Colaba	16,244	109·20	Subathoo	642	45·171	—	Jaulnah	1,382	40·52
Hyderabad	2,389	235·24	Ferozepore	988	49·595	—	Masulipatam	9,826	51·00
			Loodiana	380	50·000	„ 6 „	Vizagapatam	2,037	67·07
			Peshawur	2,401	53·311	„ 7 „			
			Dinapore	1,017	55·064	—			
			Cawnpore	745	67·115	—			
			Chinsurah	307	68·404	—			
			Fort William	783	68·966	—			
			Dum Dum	481	72·765	—			
			Lahore	1,699	84·615	„ 6 „			
			Rangoon	2,382	112·545	„ 3 „			

FORT WILLIAM. BENGAL.

References to Subjects and Queries.	Replies.
III. SANITARY CONDITION OF STATION. IV. HEALTH OF THE TROOPS.	The replies under this head are substantially the same as those of the preceding report. 1. The health of the troops in garrison at Fort William has always been indifferent, but this is in a great measure attributable to the numerous temptations existing in so large a town as Calcutta for soldiers to commit excesses. The town of Calcutta is not healthy. 2. The diseases prevailing among the native population are cholera, small-pox, fevers, intermittent and remittent, and typhoid. Spleen disease, as a sequel of intermittent fever, is common. 3. The unhealthiness of the natives is attributable to damp, brackish water, immoderate use of fruit, bad diet, overcrowding, and dirt. 4. The bomb-proof barracks are not so healthy as the others, but this is attributable to faulty privy arrangements, which are about to be completely altered. 5. The troops at this station are not camped out. 6. I have had charge of a corps in a hill station, Subathoo, and I consider a residence in the hills to be beneficial to men who suffer from debility or functional derangement of the liver, or to men recovering from fever, but highly prejudicial in cases of organic disease, more particularly that of the liver. 7. I do not think that troops returning to the plains are liable to febrile attacks in a greater degree than the men who have not served in the hills. 8. I consider that a selection should be made of men to be sent to the hills, as I do not think it benefits very many of the men. 9. Diarrhœa of a very obstinate character sometimes attacks men on their going to the hills. It is peculiar in its kind, the stools assuming the appearance of a frothy paste. Men rarely recover from this type of disease. Fever of a bilious remittent type occasionally attacks them. 10. Every precaution is taken in hill stations to preserve the health of the men. Flannel belts are worn, the men kept from exposure to wet, and prevented going down the khuds in wet weather, and use of unripe fruit, &c., is prohibited. 11. To be beneficial in cases likely to profit by residence in the hills, the winter and spring months are the best, say from October to June, but it is better to allow men 18 months from the October they go up, thus giving them the benefit of a cold season. 12. I think two years quite enough for a residence in the hills. The 32nd regiment at the adjoining station of Kussowlie suffered severely from hill diarrhœa and hepatic abscess during the third season, more so than they did during the two first. 13. The only precaution necessary to be observed for the preservation of the health of men leaving hill stations for the plains, is to take measures to prevent them getting suddenly chilled. 14. I consider that service in the plains, with one year in every four, *i.e.*, three years in the plains, and one or one and a quarter in the hills, the best course to pursue for preserving the health of troops in India. I do not think that frequent change of station in the plains is beneficial to the health of the men, and marching, except in the cold season, is very harassing to them. 15. The barrack accommodation at Subathoo was sufficient for the 2nd Fusiliers, but the sites for the old barracks were not well chosen. There were new ones building, which will, when completed, be the finest in the hills. The hospital is superbly situated, and most convenient. 16. Subathoo is under 5,000 feet above the sea level. Kussowlie and Dugshai (only nine miles from it and from each other), each about 7,000 feet. The two latter are more exposed to the keen westerly winds in winter, and have great fall of rain, and are consequently damper. The same remark applies to Darjeeling which, in my opinion, would be a better locality for the sanitarium for the greater part of the year. 17. The high land nearest to Fort William, is the Rajmahal range of hills, the elevation of which is insufficient to make any marked difference of temperature. Its distance is about 125 miles, and it is accessible by rail. The climate is damp, and the face of the country jungly. 18. I have generally found troops to be most healthy in the stations where the soil is of kunkur, or sandy with a kunkur subsoil, namely, Agra, Allyghur, Meerut, Umballa, &c. 19. I consider from 19 to 23 years of age, the best period of life at which a soldier should proceed to service in India, and the best season for them to land there is October or November, as it admits of the men getting to the most distant stations before the hot season sets in. Drafts for H.M's. corps are sent to Dum Dum on landing, those for the Indian army to Barrackpore, the first 8, the latter 16 miles from Calcutta. They are put into comfortable airy barracks, and are under instruction during their detention awaiting their turn for dispatch up the country. Recruits should be kept from getting liquor in any way, except from the canteen; they should be kept out of the sun and be made to wash, and keep themselves very clean, and to wear flannel, to which generally they are very averse. No melons, cucumbers, &c., should be allowed near the barracks. 20. There is no objection to send a corps direct to India from the home depôts; in fact, corps do better, the men being under the strict discipline of their own officers. The difficult matter is to manage drafts of different corps. With care, I consider the men are healthiest during the first portion of their service, that is, if care has been taken to keep them from liquor and exposure, and if they have been properly clad. 21. There are two modes for the transport of troops from the port to the interior, the one by flats towed by steamers, the other by bullock train. The former is one that has every comfort, the latter is the quickest method; but, as the season advances, entails great exposure. Great care is required when men go by bullock train to prevent them straggling and getting liquor in the villages, and committing excesses of all kinds. 22. A British soldier should, I consider, serve in India about 12 years. 23. Each case of invaliding brought before the Board is examined carefully by the members, and well discussed before a final decision is given. I have rarely seen a conflict of opinion; but, should this be the case, the majority would carry the question. 24. Invalids should leave India for home in January or February.
Diseases.	1. On the morning of a fixed day once every week, there is an inspection parade for the discovery of incipient diseases at this station. 2. I have not seen a case of scurvy this season; but, in 1858, it was not uncommon among the recruits sent out for the new corps raised for the Indian army. This was attributable

References to Subjects and Queries.	Replies.
IV.—Health of the Troops—*cont.*	to the length of voyage and bad constitution of the men who suffered from scurvy. I would suggest that more vegetable matter be given in the diet. 3. The usual number in my hospital of distinct hepatic disease, viz., hepatitis acute and chronic, liver abscess, and functional derangement, was about 8 or 9 per cent. of the sick. Hepatic disease in India generally arises from two causes, exposure to sudden atmospheric changes, and indulgence in spirituous liquors. Fatty degeneration is found in cases of chronic dysentery. It may be prevented, in some measure, by making the men wear flannel belts on all night duty, and keeping them from getting liquor. 4. Dracunculus is endemic to certain districts. Europeans are very rarely the subject, and it is chiefly confined to the natives. 5. I am of opinion that the number of sick from venereal disease does not exceed 4 or 5 per cent. in hospital at one time. The soldiers rarely get it in field or in their own bazaar; the mischief is done when they roam about towns on the march, or on first arrival at a large station. The women in a regimental bazaar are periodically inspected, and any found diseased are sent away. 6. The following are the diseases from which the troops at the station suffer, viz.:— *Fevers.*—Of the intermittent, remittent, and bilious types. *Dysentery.*—Acute and chronic. *Cholera.*—Bilious and spasmodic. *Small-pox.*—But very rarely. *Rheumatism.*—Acute and chronic. The admissions from the above diseases are generally from 60 to 65 per 100 on the whole, and the deaths 75 to 80 per cent. on the total deaths annually. 7. The following are the more frequent zymotic diseases at this station:—Hepatitis, bronchitis, pneumonia, febris intermittens, febris remittens, febris, sore throat, erysipelas, dysentery acute and chronic, diarrhœa, cholera, &c. The fevers prevail in the rainy season, dysentery and diarrhœa, hepatitis, and other liver affections throughout the year; sore throats, bronchitis, coughs and pneumonia in the winter and spring months, cholera from February to November. Unseasonable or sudden access of heat induces fever and cholera,—damp, fever and hepatitic affections; but the dry heat is most favourable to health. Barracks for Europeans are generally kept scrupulously clean. The natives suffer in the bazaars from the exhalations from open cesspools and cesspits, from stagnant and filthy drains, and from over-crowding. The natives are predisposed to many diseases from insufficient clothing. The changes of temperature in the 24 hours are very great. 8. There is not generally much sickness induced by the duties of a soldier in barracks. 9. Small doses of quinine have not been administered as a prophylactic against malarial disease at this station. 10. I would recommend, if an epidemic be general, the removal of men into camp from all the barracks, or from the one or more to which the epidemic may be confined in the cold season and spring, or to other buildings during the hot and rainy seasons; whitewashing the walls and floors, and looking very closely into what the men get extra in their messing from the bazaar. I would also recommend the prohibition of the use of pork and sausages,—giving the men new sources of amusement, and preventing recourse to the rum bottle to drown fear and care; having frequent inspections, the men well watched by non-commissioned officers, and that they be sent at once to hospital when any symptoms of an epidemic are apparent.
V. Intemperance. VI. Diet. VII. Dress, Accoutrements, and Duties. VIII. Instruction and Recreation. IX. Military Prisons. X. Field Service. XI. Statistics of Sickness and Mortality.	The information under these heads is substantially the same as that contained in the previous report on Fort William.
XII. Hospitals.	1. The sick from the regiments quartered in Fort William are sent into the general hospital, which consists of a centre building and two wings, in the right or eastern of which the sick soldiers are received, the centre and western buildings being kept for the public and soldiers of Her Majesty's Indian army. 2. The distance from the Fort is about a mile; there are no stables near the hospital. To the S.S.E. native huts come almost up to the boundary wall of the general hospital; but to the north and west there are no buildings. The site is healthy, though not elevated, open and well ventilated, and there are no high walls or trees which obstruct the air in any way. There is, however, an open drain, from the Calcutta Great Gaol, which passes close under the hospital boundary wall, and into which the drains of the general hospital empty their contents. This large drain or ditch seems to be very badly constructed, and it sometimes happens that the water from it flows back into instead of from the hospital drains. This, which is always a nuisance, then becomes a source of impure air, and might be the cause of disease. The attention of the local authorities has already been directed to it. 3. The water supply is abundant and wholesome. 4. The drains are mere surface drains of bricks or tiles and mortar, and are swept out perfectly morning and evening, as there is no fall—the ground being level. 5. The lower story of the hospital is not occupied by patients; the wards are, therefore, 20 feet from the ground. The surface drains receive the water from the roofs, and these with the gutters are ample for the purpose, were there only some slight slope; as it is, the water lodges unless swept away. The walls of the hospital are built of brick, are 3 feet thick, and quite sufficiently so to keep the wards cool. The verandahs are on the south side only, the breadth of which are 12 feet, and afford ample shelter from the sun's rays; but are never used for sleeping in. The centre building has but two flats, the wards three; the ground floors in the wings are used now only as store rooms. Total number of wards - - 3 The wings hold - - - 150 each } Total 420. The centre - - - - 120

FORT WILLIAM. BENGAL.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	For table of hospital accommodation in extenso, *vide* preceding Report. The position is most favourable, and the hospital receives the full benefit of the prevalent winds, the N.E. and S.W. The windows may be described as those known in England as French windows, and the arrangement seems good for purposes of ventilation. 6. The windows and doors are so numerous that no other means of ventilation are required. 7, 8. There are no means for cooling or warming the hospital wards. The walls and ceilings of the wards are cleansed and limewashed annually, but this might advantageously be repeated once a month eight feet up the wall. Note by garrison engineer:—"Regulations provide for such at the requisition of the "medical officer." 9. The privies are at the end of each building, connected by a passage with the wards, and consist of rooms in which commodes are placed and removed when dirty. A large earthen vessel in the centre is used as a urinal, and is also removed and cleansed morning and evening, or oftener, if necessary. There are no cesspits. 10. In the centre building arrangements for washing have been hitherto very imperfect, but lavatories amply large are now in course of construction. In the wings the arrangements are sufficient. 11. There are masonry baths for the use of the sick, but the slipper bath is generally more convenient. A bath room is being constructed, which will be supplied with two slipper baths and a warming apparatus. 12. Native washermen wash and dry the hospital linen, and answer very well. 13. The storage is sufficient, and dry. 14. Both wooden and iron cots are used in hospital; the latter are to be preferred. The bedding is good, made of country cloth, and stuffed with hemp. 15. The hospital kitchen is situated in a range of buildings with steward's store room, at right angles to the line of hospital buildings, and at a convenient distance from them. It is in size sufficient for its purpose, but the means of cooking are very inadequate. They consist of a line of open chulahs or square spaces enclosed on three sides with loose bricks, and open in front, and allow only of the proper cooking of boiled provisions. No means exist for roasting or frying diets, or of conveying them to the wards when done with a possibility of their reaching the patients hot, or even warm. 16. Copies of the diet rolls, &c. are herewith transmitted. 17. The provision for attendance on the sick in the regimental hospital consists of 1 hospital serjeant and 2 ward masters in the general hospital, but the sick are more particularly attended to by hospital coolies. On the whole, the attendance is sufficient. 18. I consider the general hospital to be very healthy, and am not aware of the occurrence of any hospital gangrene or pyemia having appeared or originated in the wards. 19. The hospital is imperfectly drained, like all the rest of Calcutta. 20. There are 4 ambulance carts sent every evening for the use of the convalescents; these are drawn by bullocks, and can accommodate about 32 men. There are no shady walks, but there are seats under a very large banyan tree, and convalescents can walk about the grounds or in the verandah. 21. There is a detached building, divided into 2 wards, one of which is used as a hospital by the women and children of the military in Fort William, the other by the public and civil part of the community; the arrangement is not good. 22. There are no special local hospital regulations. 23. The medical officer has no direct power except that of making a representation to either the brigadier or the superintending surgeon. Should any repairs be required of a trivial description, a memorandum is sent in direct to the executive engineer. With regard to diet, anything required or ordered in excess of the regular diet is entered by the surgeon under the head of "Extra," and forwarded in a separate statement to the superintending surgeon at the end of each month. This holds good either at the station, in camp, or on the march. 24. There are no convalescent wards or hospital at the station. Most undoubtedly the formation of such a ward at some short distance from Calcutta (as Barrackpore) would be attended with much advantage to the sick.
XIII. Burial of the Dead.	For information under this head, *vide* preceding Report.

(Signed) M. Smith, Brigadier,
Commanding Fort William.
R. B. Kinsey, F.R.C.S.,
Late Garrison Surgeon, Fort William.
Robert H. Sankey, 2nd Captain and Brevet Major,
Offg. Garrison Engineer.

Dated 19th June 1860.

CALCUTTA (GENERAL HOSPITAL).

References to Subjects and Queries.	Replies.
XII. Hospitals.	1, 2. The sick from the regiments quartered in Fort William are sent into the General Hospital, which consists of a centre building and two wings; in the right or eastern of which the sick soldiers are received; the centre and western buildings being kept for the public and soldiers of Her Majesty's Indian army. The distance from the fort is about a mile. No cavalry being quartered in the fort, there are no public stables. To the south and east native huts come up to the boundary of the general hospital, but to the north and west there are no buildings. The site is open and well ventilated, and there are no high walls or trees which obstruct the air in any way. The site is healthy, though not elevated; but there is an open drain from the Calcutta great jail which passes close under the hospital boundary wall, and into which the drains of the general hospital empty their contents. This large drain or ditch seems to be very badly constructed, and it sometimes happens that the water from it

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	flows back into instead of from the hospital drains. This, which is always a nuisance, then becomes a source of impure air, and might be the cause of disease. The attention of the local authorities has been already directed to this. 2. The water supply is abundant and wholesome. 4. The drains are all open surface drains constructed with bricks or tiles and mortar, and are supposed to discharge their contents on one side into the drain above alluded to, and on the south side into a similar drain about 100 yards south of the hospital inclosure. The ground being almost level there is no fall, and the drains are therefore swept out perfectly, morning and evening. 5. The lowest wards occupied are raised 2 feet above the ground, and there is free perflation of air underneath. The surface drains receive the water from the roofs, and it does not therefore sink into the subsoil. The surface drains and gutters are ample for carrying away the rain-fall, were there only some slight slope; as it is the water lodges unless swept away. The hospital walls are built of bricks; they are 3 feet thick, and quite sufficient to keep the wards cool. The verandahs are on the south side only, are 12 feet, and afford ample shelter from the sun's rays. They are never used for sleeping in, and have not hitherto been used for the accommodation of sick, convalescents or others. The centre building has but two flats, the wards three. The ground floors and wings are used now only as store-rooms. The total number of wards is three, the wings holding 150 each, and the centre 120 making a total of 420. Table of hospital accommodation:— Date of construction - - - 1795 Total number of wards - - - 3 Total regulation of beds - - - 420

Wards or Hospital Huts. No.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.			
	Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.	
Centre. 1 centre	49	25·5	18	97,821	1,630	181	1 foot 6 inches.	16	10	5	Can accommodate 120 patients in the whole building, including upper and lower flats.
Centre. 2 sides	49	20·5	18					2	10	4	
Centre. 1 front	62	20	18					10	10	5	
Centre. 2 sides	26	18	18					18	10	6	
Eastern Wing. Centre	140·5	17·75	12	29,926	927	78		26	8	4	Can accommodate 150 patients without crowding in the whole building, including upper and lower flats.
Eastern Wing. 1 side	140·5	10·5	12	17,703				12	8	4	
Eastern Wing. 2 sides smaller	22·25	10·5	12	5,607				18	8	4	
Eastern Wing. Wards for eye cases	23·5	9·	12	5,076				6	8	4	
Western Wing. Centre	147·5	17·75	12	31,372	977	81		26	10	5·5	Can accommodate 150 patients without crowding, including upper and lower flats.
Western Wing. 1 side	22·25	10·5	12	5,607				12	8	4	
Western Wing. 2 sides	147·5	10·5	12	18,588 ca.				12	10	5.5	
Western Wing. Wards for eye cases	23·5	9·	12	5,076				6	8	4	

The position of the hospital is favourable, and the hospital receives the full benefit of the prevalent winds, the north-east and south-west. The windows may be described as those known in England as "French windows," and their arrangement seems good, and conduces to free ventilation.

6. The windows and doors are the means of ventilation, and these are so numerous that no other method is required. Each window is supplied with Venetian doors outside the glass, and all so constructed as to be opened or shut at pleasure. The jalousies are constructed in the usual way, and may be opened or shut as required, except in certain rooms intended for the reception of insane or violent patients in which the jalousies are fixed.

7, 8. There are no means of cooling the air admitted into wards at present, and no apparatus is required for warming the wards. The walls and ceilings of the hospital are cleaned and lime-washed once a year, but this might be repeated with advantage once a month, 8 feet up the wall.

9. The privies are situated at one end of each building connected by a passage with the wards, and consist of rooms in which commodes are placed. These are removed when dirty. A large earthen vessel in the centre is used as an urinal, and is also removed and cleansed morning and evening, or oftener if necessary. There are no water-closets, nor are these used in India; the entire removal of all filth to a distance being considered the best plan. There are no cess-pits. The night-soil is received in a cart morning and evening.

10. The arrangements for washing in the centre building have hitherto been very imperfect, but lavatories, amply large, are now in course of construction. In the wings the arrangements are sufficient.

11. There are masonry baths, but the slipper bath is generally more convenient for the sick.

12. There is a small pond or tank in the compound or inclosure, and there are conveniences for the native washermen who wash the linen. These means have hitherto been found sufficient.

13. The storage is at present neither sufficient nor dry, but the want of space is entirely due to the fact of a large quantity of old clothing and hospital furniture being stowed away in storage intended for the general hospital alone. For the hospital itself the space is ample.

14. Both wooden and iron bedsteads are in use in hospital. The last are much to be preferred for cleanliness, in fact, those with iron bottoms are as good as can be wished, but the patients generally prefer those with rattan bottoms. The bedding is good, and is made of country cloth stuffed with hemp.

15. The hospital kitchen is situated in a range of buildings, with a steward's store-room at a right angle to the line of the hospital, and at a convenient distance from them. It is in size sufficient for its purpose, but the means of cooking are very inadequate. These consist of a

CALCUTTA. (GENERAL HOSPITAL). BENGAL.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	line of open chulas or square places, enclosed on three sides, with loose bricks, open in front, and allow only of the proper cooking of boiled provisions. No means exist either for roasting, or properly frying diets, or of conveying diets so treated to the wards with the possibility of their reaching the patients hot or even warm. It is understood, however, that to remedy this defect a plan exists for furnishing to the hospital a stove on an American pattern to supersede the existing chulas altogether, this having been most favourably reported on by a committee. 16. Copies of diet rolls, &c., have been transmitted. 17. There is one hospital serjeant in the regimental hospital, and there are two ward coolies in the general hospital. The sick are more particularly attended to by hospital coolies. Nurses are not employed to attend, but if required orderlies are sent from the regiments to which the sick belong. In the civil hospital the juniors of the subordinate medical department, attend particularly to such cases as are considered to require it. On the whole the attendance is sufficient. Since writing the above, nurses have been sent in the proportion of one to every 25 sick. These are not Government servants, but are paid from funds furnished by the benevolent. 18. I consider the general hospital to be very healthy, and am not aware of the occurrence of any epidemics in it. 19. The deficiencies have already been pointed out, but to recapitulate, they consist,—1st, in imperfect drainage which depends on inattention to the fall, all the drains seeming to be on one level; 2ndly, in the very bad accommodation for the reception of female patients all being necessarily received into one ward in which it is impossible to class the cases, and where women in labour, of necessity, are treated in the common ward; 3rd, since the garrison of Fort William has lately been formed of more than one regiment, or in consequence of several detachments being present there, very great inconvenience has been experienced by the members of the subordinate medical department. The quarters provided in the general hospital being calculated only for the accommodation of the usual establishment and for those attached to one regiment; should the present state of things continue, either two or three would have to live in quarters intended for one, or other buildings must be constructed. The remedies for the above deficiencies are too obvious to require any suggestions. There is also an evil of considerable importance. The walls of the three buildings seem to have settled after construction, and consequently the lower story is on the level of the general surface, while the brickwork which ought to slope from the wall to the drain inclines from the drain to the wall. Much more efficient fastenings are required for both doors and windows, as hardly a gale occurs without several being blown violently open and the fastenings broken or rendered useless. As these storms are accompanied with heavy driving rain, something more than inconvenience is experienced in the ward when this occurs. 20. Four ambulance carts are sent every evening for the purpose of affording the means of exercise for convalescents; these are drawn by bullocks, and can accommodate about 32 men. There are no shaded walks, but there are seats under a very large banyan tree, and convalescents can walk about the grounds or in the verandahs. 21. There is a detached building divided into two wards, one of which is used as a hospital by the women and children of the soldiers in Fort William, and the other by the public and civil part of the community. The arrangements for sick women and children are not good, as sometimes there is much crowding. More privacy is desirable, and detached rooms ought to exist in which women in labour can be received. At present all cases must be accommodated in the common ward, which is an arrangement not conducive either to health or comfort. 22. No diet tables, diet rolls, &c., are used, except those contained in the code. 23. The medical officer has no direct power in matters appertaining to the sanitary state of the hospital, except that of making a representation to either the brigadier or superintending surgeon; or should any repairs be required of a trivial description a "memo," is sent in direct to the executive engineer. With regard to diet, anything required or ordered in excess of the regular diet, is entered by the surgeon under the head of "extra," and forwarded in a separate statement to the superintending surgeon at the end of each month, and this holds good whether his charge be at a station, in camp, or on the march. 24. There is no convalescent ward or hospital at the station, but most undoubtedly the formation of such a ward at some short distance from Calcutta (as Barrakpore) would be attended with much advantage to the sick, and probably the expense would not be great.
XIII. BURIAL OF THE DEAD.	The information regarding the burial-ground has been derived from the undertaker who has been attached to the hospital since 1856. 1. The burial-ground is about 500 yards from the general hospital, and a mile from the garrison of Fort William. It is to the south of the fort, and south-west from the hospital. 2. Its area is 724,535 feet, and its soil is sandy. There are no drains within the burial-ground, but a large drain runs close on the north side, and is in fact the boundary in that direction. On the south runs Tolly's nullah, and on the east is another large dry drain, and the public road. On the west are the huts for coolies selected by the Emigration Office. Decomposition takes place readily, and the ground is kept in good order. 3. The grave space allowed is 9 ft. 6 in. by 5 ft. 6 in., with an interval between the graves of 2 ft., the depth being 6 ft. from the surface. Graves are re-opened after the expiration of three years when no marks or tombs are put over them. Family vaults are re-opened when required for the interment of any of the family, and no special time is fixed in such instances. Every grave, however, is supposed to be full after three or four interments; the last coffin, therefore, is only three feet from the surface. I am not aware that interment is compulsory at any time. The rule seems to be that it take place within 24 hours after death, and this is so fully acted up to that compulsion is not required. 4. The graveyard was slightly offensive in the years 1857 and 1858, when the mortality was very great. The garrison chaplain seeing such the case, sent down two carts of lime to be strewn over the graves, after which the smell subsided, and since that time there has been no offensive odour perceptible. The cause of the smell was owing to the rapid decomposition caused, probably, by the water from Tolly's nullah, which flowed into the burial-ground, and lodged in the graves. At all times interment very rapidly follows the death of a British soldier, and generally 12 hours is the time allowed to keep the corpse, but I am not aware of any particular time being fixed by order or police regulation.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	5. The Mussulmen dead are taken away by their friends, and buried in their own cemetery at Gobra. The Hindoo portion of the population when dead are taken to the river side and burnt. 6, 7. No injury arises to the public from the present practice. The burial-ground of the Mussulman population is about 2½ miles distant, and the ghat for the Hindoo people is about 3 miles south on the banks of Tolly's nullah.

No date or signature is attached to this report.

BARRACKPORE.

Accommodation { Queen's troops { Artillery, 1 battery, Royal Artillery. Infantry, 1 regiment (4 barracks; married men's quarters occupied by European Indian Army recruits). Native Troops, Infantry, 1 regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is alluvial, with abundance of rich tropical vegetation. It is flat, with occasional low marshy ground, and a moderate quantity of wood and jungle. The river Hooghly runs towards the south, and there are a few marshy or watery flats or jheels of no great size in the vicinity. 2. The elevation of the station above the sea is about 23 feet, but it is on the same level as the adjacent country. The river Hooghly in level is about 5 or 6 feet lower than the left bank on which the station lies. There is no higher or healthier ground in the neighbourhood. 3. The nearest mountain lands are the Rajmahal hills, rather less than 120 miles off. A spur of these hills, on which it was proposed to erect a sanitarium (Parisnauth) is upwards of 4,000 feet above the level of the sea. 4. The nearest water is the river Hooghly, which forms one boundary of the station, the sea being about 80 miles distant. There is no overflow from the river, nor to any important extent from the tanks in the station. No ravines or broken ground of any importance exist near. 5. Although there is a great deal of vegetable growth in the neighbourhood, it is not so extensive as to interfere in any material degree with the ventilation of the station, and as all the buildings are thatched, they expose but little surface of masonry to the effects of the sun. The S.W. monsoon, laden with moisture from the sea, sets in during April, and continues till about the end of May, when calms alternating with high easterly winds are frequent; clouds collect, and the rainy season begins, continuing up to the middle of October. The station, however, is never really exposed to cold winds at any period of the year. 6. The surrounding country is principally cultivated. No works of irrigation are in the vicinity of the station, nor has artificial irrigation had any perceptible effect on the health of the inhabitants. The growth of rice is prohibited within the boundary pillars of the cantonments, and no cultivation of indigo or hemp is carried on near the station. 7. The town of Serampoor opposite, on the right bank of the river, is the only town of any size near the station. 8. The geological structure of the cantonment is formed of delta deposits, having a loose spongy surface soil with sandy or clayey subsoils. The present European barracks are built upon the site of the old native infantry lines, which had been in existence many years. 9. Water is found during the dry season at a depth of about 12 feet, and during the rainy season at about 8 feet, below the surface. 10. In several situations within the cantonment boundaries the rain-fall does not thoroughly flow out until the rainy season ends,—it is renewed before it has time to run off; generally, however, it sinks into the subsoil or drains off into the river with sufficient freedom; in some places, however, where, probably, a retentive clayey subsoil would be found, the surface soil is always wet and swampy all the rainy season. No drainage from any higher level sinks in the subsoil of the station. 11. The water supply is obtained from tanks, wells, and river, but principally from the first-mentioned source, being stored in open tanks; but I cannot state the extent of tank surface. Before the commencement of the rainy season they often get low, and the shallower ones become nearly dry, but during the rains and cold weather they keep full. I cannot myself furnish any information as to the nature of the plants and animals contained in the tanks, nor can any medical officer now at the station. No tank used for drinking purposes is also used for bathing, yet the water is often polluted by the falling into it of decayed leaves from adjacent trees. No drainage impurities are permitted to get into the tanks, and I do not think either malaria or nuisance has ever been observed to proceed from them. 12. The large tanks of the station furnish a never-failing supply of good water, which is pure, and without taste or smell. The water from the tanks and wells was forwarded by me to the chemical examiner at Calcutta, and the following is his analysis:— "The tank water is very pure," an imperial quart evaporated to dryness leaving only 2·7 grains of solid residue. Total solid residue - - - - - 2·7 grains Consisting of—Earthy carbonates - - - 1·02 „ Silica - - - - - ·38 „ Saline soluble matter, chiefly chlorides, with a little sulphates and carbonates 1·3 „ The well water contains a large quantity of solids; an imperial quart yielded 12·0 grains of solid residue. Total solid residue - - - - - 12·0 grains Consisting of—Earthy carbonates with a little sulphate of lime - - - - 6·46 „ Silica - - - - - ·44 „ Soluble saline matters, chiefly chlorides, with a smaller proportion of carbonates 5·1 „

BARRACKPORE-BENGAL.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	Both waters contained a little organic matter. The water is distributed in skin bags by bheesties or water-carriers, and no better supply could be obtained. 13. No reply to this query. 14. To the question, as to after what amount of inquiry or examination as to topography, climate, &c., new stations are selected, I can only say that, in my opinion, medical officers have not so often been consulted on these points as is desirable. It seems to me that, conjoined with one officer for reference and guidance as to the military requirements of the new station, the committee for determining the site of a new cantonment ought to be exclusively medical, the education, observation, and experience of medical officers peculiarly fitting them for such duties.
II. CLIMATE.	1, 2. There have never been, with the exception of hospital thermometers, any instruments for meteorological purposes at this station, and I am therefore unable to give any satisfactory meteorological table such as is here required. I would say generally that according to thermometrical observations the temperature in the hot season ranges from 82° to 104° in the shade; in the rains from 80° to 96°, and in the cold season from 54° to 80°. The mean temperature would probably be about 79°. The rainy season, as I have before said, usually sets in about the end of May and ends about the middle or 20th of October. Within this period there are often considerable intervals without any rain, during which the temperature is close and oppressive. In the middle of October the wind usually changes to north, the atmosphere clears, the nights are calm with heavy dews, and there are occasional dense fogs in the morning. 3. The climate I consider a moist, warm one, with little variation of temperature. I do not conceive that any peculiar effect from what irrigation exists in the neighbourhood can be observed. So far as experience yet goes, it seems a moderately healthy station for European troops, not so much so for native troops. Drills cannot be carried on in the rainy season, except to a limited extent, on the roads, for the parades are then mere swamps. In the hot weather the early mornings only are suitable for parade duties, for the evenings are generally sultry and oppressive. In the cold weather time should be allowed for the sun to drive away the dew from the grass, which is, in the mornings, frequently heavily laden with moisture. The most healthy months are from the beginning of November till perhaps the middle of July; August, September, and October being the most unhealthy months. Diarrhœa, dysentery, cholera, and fevers of the remittent and intermittent type, are then the prevailing diseases. 4. I am not aware of the existence of any healthier district near the station. 5. The following are the stations at which I have served, with my opinion as to their comparative salubrity, *Mhow* and *Neemuch* (central India), are both healthy stations, with an occasional year of rather severe febrile, remittent and intermittent, disease after the rainy season. *Loodiana.*—Formerly a hot and healthy European station; but latterly subject to frequent returns of intermittent fever, which although seldom fatal, sapped the strength from the frequency of their return. After repeated inquiries and several committees on the subject, no satisfactory cause for the change could be discovered. *Jullundur.*—In my experience a hot but healthy station. *Deyrah Dhom.*—An equable temperature and healthy in the station, as also in its immediate vicinity only. *Barrackpore.*—I have already spoken of. *Dinapore.*—I was only a few months resident at; it was moderately healthy. *Peshawur.*—Is an unhealthy station for both Europeans and natives. Few escape the intermittent fevers (often of a low reducing kind) that prevail there, and the frequent returns of which shatter the constitution, and lay the foundation of grave organic disease of the abdominal organs. *Ferozepore.*—A moderately healthy station, but very hot and dry. *Lucknow* (old cantonments).—A moderately healthy station.
II. SANITARY CONDITION OF STATION.	1, 2, 3. Plans of the station, adjacent country, &c., are transmitted. The drains are all open, and nearly all of earth. The excreta are now ordered to be carted away, and cesspools are done away with entirely. The drains vary in depth from a few inches to 6 feet, and in breadth from 1 foot to 12 or 15 feet. 4. Table of barrack accommodation. Date of construction - - - - - - - 1858 and 1859. Total number of rooms or huts - - - - 85 rooms, besides 30 small rooms for non-commissioned officers. Total regulation number of non-commissioned officers and men - - - - - - 960 single, and 120 married men.

Barrack Rooms or Huts.	Regulation of No. of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				No.	Height.	Width.
		ft.	ft. in.	ft. ft. in.			ft.			Doors. ft.	ft. in.
There are 6 rooms in each barrack built of brickwork; 5 in those with iron frames; 15 barracks in all.	In brickwork barracks 16. In those with iron frames 20.	Brickwork barracks.						Some have 18 in. some 22¾.	8	9	4 6
		48	20 0	18 + ½	20,160	1,260	60		10 Doors.	9	4 6
		Iron barracks.									
		66	28 6	10 + $\frac{1.2 \cdot 1.6}{2}$	34,057	1,702	95·23		10 Windows	4	2 6
Total - -											

References to Subjects and Queries.	Replies.
Guard Room. Prison Cells.	Is a portion of a small barrack, in every way similar to the larger kind. An estimate for these is now before Government on standard plan. 5. The windows are on opposite sides, opening from the middle to each side. There are open verandahs from 10 to 12 feet wide on one side, and an enclosed verandah on the other side, the whole length of the barrack; but they are never used as sleeping quarters for soldiers or others. The windows are jalousies, and in some cases the doors also. 6. The bedsteads are wooden frames, with hoop iron bottoming, the bedding consisting of blankets, sheets, and cotton-stuffed quilts. 7. The common double-poled new pattern tent used in camp contains 16 men. 8. With regard to ventilation, the temporary brick and iron frame barracks have free communication with the verandahs for nearly three feet from the roof downwards. Those in the barrack square, Nos. 1, 2, and 3, have ventilators in the apex of the roof at equal distances. With open doors, the ventilation is generally good and sufficient in the hot weather and rains, as also in the cold months. No means of cooling the air of barrack rooms exist at this station. 9. Some of the barracks have thatched roofs, others being thatched and covered with tiles. Some are built on brick and mortar pillars, while others are constructed on iron frames, the sides being built of bricks in mud cement. 10. The flooring is of twelve inch tiles laid in bricks over rammed earth, and varies in height from 2 to 3 feet, but there is no passage of air underneath. 11. The materials used in the construction of the barracks are suitable, the buildings being very temporary and semi-permanent. They are kept in repair by the Public Works Department, and the walls and ceilings are whitewashed once every six months; autumn and spring. 12. Each barrack has a wash-house, but at present there is no bath; an estimate, however, has been submitted for one. 13. The cook-houses have been formed out of old bells of arms. Water is supplied by bheesties, a small drain carrying away the refuse. The washing and drying of linen is performed by washermen, generally outside the station. 14. The privies and urinals are supplied with pans and tubs, the contents of which are daily removed. The cesspools have been filled up. 15. The ventilation of these buildings has been already described. The barracks are lighted at night by lanterns, six per company. 16. There are only surface drains and no sewerage, filth of all kinds being constantly removed to a distance in carts. The drainage is sufficient, however, to carry away all surface water, &c. I have never observed any appearance of dampness in any part of the barracks or hospital. No cesspits of any kind exist in the station. 17. The cantonment is traversed by large open drains, not lined with masonry, extending from the parades through the barracks and compounds of officers to the river. Some of them open into a large tank on one side of the Government House and park, the overflow of which also escapes into the Hooghly. These drains in the rains soon become choked with rank grass and weeds, and do not always allow a free circulation. Further remarks on this subject are contained in letters appended to the Report. 18. This is the only vegetation not kept down at this station, and I have no doubt that evil results from it. The refuse and manure, &c., are daily removed to a distance in conservancy carts, four of which are employed for the purpose. The drains from the privies, &c., are open and kept clean. A barrel cart is kept at each latrine, &c., in which the filth is carefully removed. No old walls or hedges of consequence exist in or near the station. 19. The bazaar is clean, tolerably drained and ventilated, and not overcrowded. Water is obtained from the adjacent tank, and the management of the bazaar is in general unobjectionable. A light tax is levied on the inhabitants for the payment of an establishment of sweepers, and police are instructed to apprehend all people whose premises are not kept in a properly clean state. The exteriors of the houses are generally clean and in tolerable repair. Dungheaps and cesspits are not permitted within them. No nuisance is ever experienced in barracks from wind blowing over the native houses. 20. Animals for the use of the soldiers are slaughtered outside the cantonments, behind the Sudder bazaar, by which all nuisance is avoided. 21. No reply to this query. 22. The artillery stables are three long sheds, supported on wooden pillars, and open on all sides. Their situation is about 150 yards to the north of the barracks, the hospital being at a great distance. The manure is removed daily in carts. 23. No reply to this query.
Officers' Quarters.	1. The officers live in detached houses, flat roofed and thatched. Their sanitary condition is good, and the drainage and ventilation sufficient. No improvements are required.
V. Health of the Troops.	1. For Europeans (excluding epidemic causes), I consider Barrackpore healthy, but with regard to native troops, the duties, diet, &c., injure the health of the up-country soldiers. It was found that the mortality among native troops, and the number of men who required sick leave to return to their homes in the third year of residence, were so large that latterly they were relieved every two years. The adjoining native population are moderately healthy. 2. So far as my experience goes, I may observe that the epidemics that occasionally visit all stations are not more severe at Barrackpore than at neighbouring cantonments—rather less so indeed. The prevailing diseases among the native population are intermittent fevers, dysentery, both chronic and acute, splenic enlargements, and epidemics of cholera; elephantiasis is also common. 3. No observation to make in reference to this query. 4. Her Majesty's 53rd were last at Allahabad, where they had been only three months, during which time they suffered rather severely from fever and cholera. They left it in August, and arrived here in September 1859, since when the regiment has been very healthy. An European recruit depôt for the Indian army, necessarily varying very much in strength, is also at this station. These men are sent up from shipboard, and, ignorant of the evils of exposure, liquor, unwholesome food, &c., they suffer much more than older soldiers. Bowel complaints, including fatal dysentery and cholera, are very frequent during the rains. I do not think, after careful inquiry, that any portion of the men's accommodation is more unhealthy than the rest.

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	5. The troops are never camped out unless when marching in relief to other stations. 6, 7, 8. I have never been in charge of troops at hill stations, but I do not think that a long residence in such stations renders troops more or less liable to attacks of febrile or other diseases on returning to service in the plains. I approve, however, of the selection of hill stations for troops. 9. Troops going to hill stations are sometimes subject to diarrhœa, of tedious or intractable nature, which is not, however, frequent. It occurs at the commencement of the rainy season. 10. I have not had sufficient experience of hill stations to speak of the precautions necessary to be observed by troops on going to those stations. 11. The periods best adapted for residence in such stations are the hot and rainy months, and so far as the end of November. 12. I know of no period of residence beyond which injury is likely to be inflicted on the health of troops on returning to service in the plains. 13. I know of no precautions necessary to be specially observed by troops leaving hill stations for the plains. They sometimes leave the hills too early in the winter. 14. With winter service in the plains, and residence on the hills from the end of April till November, I have little doubt Europeans could be kept in the healthiest condition they are capable of being in India. I do not consider that service in the plains, with short periods of change to hill stations, would be nearly so conducive to their health, but I consider change of station on the plains would be beneficial both to health and spirits. 15. I cannot reply to this question, in reference to the accommodation on hill stations, as I have not seen a hill station for many years. 16. I cannot say what are the most suitable ranges of elevation for hill stations. 17. There is no high ground in the neighbourhood of the station which could be advantageously occupied as a hill station. 18. I cannot say truly that I have any experience to show what particular class of surface and subsoil is most suited for stations. 19. Soldiers proceeding to India should always be from 21 to 25 years of age, and should land there during the winter months, *i.e.*, after the 1st of November. With regard to the disposal of troops on first landing, I have had no experience of any value, having always until recently served at up-country stations. The recruits of Her Majesty's depôt here are generally sent from Calcutta in carriages. They have good barrack accommodation and very little drill while here. The precautions I should recommend for preserving the health of recruits on first landing in India are, great attention to diet, particularly care as to modes of cooking, restriction as to exposure in the day time, and in the use of native fruits, beverages, &c., anxious and unremitting attention to ventilation, and to avoid the crowding of barracks; evening drills, except in the cool months, occupation at trades, and moderate recreation. A staff of experienced commissioned and non-commissioned officers should be specially appointed for this service. 20. I see no reason why troops should not be sent direct from the home depôts to India. The general directions I have noted above are all which I should recommend. I do not think residence at hill stations on landing would accustom troops to the plains' climate, or, except in the case of sickly men, enable them to bear it better. 21. In the cold season the men are conveyed from the port to the interior in carriages, by railways, and occasionally partially by regular marches. In the rainy season, and till the beginning of winter, steamers on the river convey large portions of the troops. The great objects to avoid are passive exposure to the sun, the use of intoxicating drinks, and overcrowding in the flats of the steamers. 22. The number of years a British soldier should serve in India should be about 15; or 25, if it were possible to keep him temperate. 23. I have no objection to make, or suggestions to submit, as to the manner of conducting the business of medical boards. 24. It is desirable that invalids should leave India for home in the cold weather, or so as to arrive in England about the middle of May or June—not before.
DISEASES.	1, 2. There are regular weekly inspection parades for the discovery of incipient diseases. There has been no case of scorbutus, or scorbutic disease, among the troops at this station. 3. I do not think hepatic diseases are so frequent at this station as in up-country cantonments. There have not been more than 2 per cent. of cases treated. In up-country stations the temperature is higher during the hot weather, colder in the winter months, and alternations of temperature are more marked. The latter I conceive to be the more frequent cause of hepatic diseases. Intemperance and exposure to solar influence are also fruitful causes. I do not believe that it is *frequently* the consequence of other diseases, and I think the use of flannel, temperance in eating and drinking, and avoidance of exposure to the sun, the best prophylactic measures. 4. Dracunculus is not a disease that occurs in this part of India. 5. The proportion of venereal diseases at Barrackpore is rather less than at other stations, and is about 13 per cent. to total sick from other diseases. Lock hospitals would be of some use, but not nearly so much as in Europe. The practical difficulty would be to induce native women, unless under very aggravated circumstances, to enter them. 6. The prevailing endemic diseases are, continued, remittent, and intermittent fevers, which are most prevalent towards the end of the rains, and in the middle of the hot weather—intermittent the most frequent. These fevers are not often attended with local complications. Dysentery is a frequent and dangerous disease. Cholera in an epidemic form is not uncommon. It prevailed in this station in July last, and among the recruits was rather fatal. Small-pox is rarely met with. Rheumatism is frequently treated. The proportion of admissions from these diseases to the total of other diseases is about 600 to 1,000. Proportion of deaths from ditto to those from other diseases 3 to 1, *i.e.*, in 1,600 cases about 600 would be from the above-mentioned diseases, and 1,000 from all others. Out of the former 3 would die to 1 of the latter. 7. The fevers generally are of an uncomplicated character. Cholera, as here developed, presents the usual terrible and fatal characters, and the same may be said of dysentery. Intermittent fevers are the most prevalent of any form. Fevers prevail most in the hot months, previous to the rains; dysentery and cholera in the beginning of the hot weather, and about the middle of the rains, when the weather is hot and steamy, and the heat is not

Reerences to Subjects and Queries.	Replies.
V. Health of the Troops —*cont.*	much mitigated by heavy rains. Great and close heats, without any occasional high winds, precede and accompany the appearance of these diseases. These diseases are not more prevalent in one part of the station than in another. Crowding in barracks, bad ventilation, intemperance in eating and drinking, occasional sun exposure, want of occupation and recreation, predispose European soldiers to attacks of cholera, fevers, dysentery, hepatic disease, &c. Among the natives it is caused from their low *physique*, they being inhabitants of a moist, warm country, and their generally poor diet renders them ready victims to most epidemic diseases. 8. I regard crowding in barracks (particularly at night), rum, and want of employment and amusement, as the three great causes predisposing the soldier in India to attacks of epidemic and other diseases. 9. Small doses of quinine have not been tried as a prophylactic against malarial diseases at this station that I am aware of. At other Indian stations (Loodiana and Peshawur) I have frequently tried it for that purpose. In intermittent fevers of short standing it was frequently useful in the intervals; but in those of long standing, and when given to those who had not previously suffered, and residing in a district well known to be malarious, I never felt satisfied that it was useful. In epidemics of dysentery and cholera I believe it would be beneficial; but I have never used it on a sufficiently large scale to speak with confidence on the subject. 10. In order to prevent as much as possible the prevalence of epidemic disease I should recommend the moving of soldiers into camp, if possible, and giving them ample breathing room in their tents when there, thinning as much as practicable the numbers sleeping in each building, and a free use of lime and charcoal. I have faith in the prophylactic use of quinine in epidemics of cholera, fever, and dysentery. Less use of liquor, and improved dietary generally, with the careful avoidance of unripe and native sour fruits, and bad ginger-beer and other bazaar beverages, which are sometimes most deleterious. Exciting the men's minds cheerfully is, of course, if practicable, a powerful means of prevention, and if united with change of scene, is doubly useful. Elevation of the barracks eight or more feet from the ground floor at this station, particularly where the drainage is not good, would be a preventive to disease.
V. Intemperance.	1. Liquor is too easily procured at this station; and I fear that a good deal of intemperance exists. I cannot state the proportion of confirmed drunkards, but they are rather a large number. 2. The proportion of admissions into the hospital from diseases caused directly by drink is from 14 to 15 per cent.; from indirect causes, I have no data to state satisfactorily upon. The same may be said of the numbers admitted with diseases contracted by habits of intemperance, neither can the other officers in medical charge of the troops at this station assist me in ascertaining. Drunkenness, *per se*, is punished as an offence. 3. Rum and brandy are sold at the canteen; two drams a day are allowed from canteen. Spirit is part of the ration for soldiers; but it is not compulsory to take it. On the march beer is not often to be had, and rum is consequently more drunk. The canteen is not open until 12 noon, so that liquor is not, or ought not to be, procurable from that source. Spirit is not usually given to convalescents; beer is frequently; ginger beer, lemonade, and soda water are sold at the canteen or bazaar; the two former are often not very wholesome. 4. The consumption of spirits by convalescents and troops, in my opinion, is injurious. I do not think it is conducive to the internal efficiency of the corps. 5. If the use of spirits were entirely abolished among European troops, I am firmly persuaded the mortality among them would be *extraordinarily* diminished. Improvements should be made in dietary, &c. 6. The use of malt liquor is, in my opinion, much less hurtful than spirit; beer and porter in moderation, although by no means essential, are not injurious, and are generally prized by the men. 7. Coffee, tea, lemonade, soda water, and similar drinks, are much used at the station; they are far less injurious than spirits, or even malt liquor. 8. The suppression of spirit in the ration would decidedly prove beneficial to the health of the troops, whether convalescent or otherwise. It would, however, cause or tend to excite discontent; for even the prejudices of well educated men are difficult to overcome. 9. The prohibition of the sale of spirit in the canteens would be beneficial to the troops. 10. I have nothing further to recommend than I have already done, viz., employment, recreation (two most difficult things to secure on a large scale in India); good tea, coffee, milk, a little more variety and improvement in the quality of the food generally; more attention to cooking and cooking vessels. 11. The following is a copy of the Barrackpore Suddur bazaar regulations:—

Sale of spirits in cantonments.—Any person not amenable to articles of war, or camp follower, selling spirits, &c. without licence, to or for the use of soldiers in cantonments, liable to fine or imprisonment.

295. If within any military cantonment, or within any limits around the same to which the provisions of this Act shall be extended by an order of Government to be publicly notified, any person not amenable to articles of war, or any sutler or camp follower, shall knowingly barter, sell, or supply, or offer or attempt to barter, sell, or supply, any spirituous liquor, wine, or intoxicating drug, to or for the use of any European soldier, or to or for the use of any European or Eurasian being a camp follower or a soldier's wife, without a written licence from the officer commanding at the station, or from some person having sufficient authority from the commanding officer to grant such licence, the person so bartering, selling, or supplying, or offering or attempting to barter, sell, or supply, such spirituous liquor, wine, or intoxicating drug as aforesaid, shall be liable, on conviction before a magistrate, to a fine not exceeding fifty rupees, or in the discretion of the Magistrate to imprisonment, with or without hard labour, for any period not exceeding one calendar month. Act XVIII. 1853, Sec. 1.

In the case of a second conviction liable to increased fine or imprisonment, and spirits may be confiscated.

296. If any person convicted of an offence under Section 1. of this Act shall be convicted under that section of an offence subsequently committed, he shall be liable to a fine not exceeding one hundred rupees, or to imprisonment with or without hard labour for any period not exceeding three calendar months; and in such case any spirituous liquor, wine, or intoxicating drug, within such cantonment or limits, which at the time of the commission of such subsequent offence shall belong to, or be in the possession of such person, shall without further proof, be deemed to be in the possession of such person for the purpose of being supplied to European soldiers contrary to the provisions of this Act, and shall be liable to be seized and confiscated. Act XVIII. 1853, Sec. 2.

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Camp followers, &c. having, &c. more than one seer in cantonment, liable to punishment.

297. If any camp follower, or military pensioner, or the wife or widow of any soldier, camp follower, or military pensioner, shall within such cantonment or limits remove, convey, or have in his or her possession, any quantity of spirituous liquor, or wine exceeding one seer or quart, without a permit, to be signed by the officer in command, or such other officer as may be appointed by him to grant permits under this Act; every such person shall be liable upon conviction to a fine not exceeding fifty rupees, and for any subsequent offence to a fine not exceeding one hundred rupees, or to imprisonment, with or without hard labour, for any term not exceeding three calendar months. Act XVIII. 1853, Sec. 3.

References to Subjects and Queries.	REPLIES.
VI. DIET.	1. The composition of the ration for Queen's British troops consists of mutton once a week (generally on Sunday), beef on other days; meat, 1 lb., bread, 1 lb., rice, 4 ozs., tea, $\frac{5}{7}$ oz., sugar, $1\frac{3}{7}$ oz., salt, 1 oz., potatoes, 12 ozs., onions, 4 ozs., wood, 3 lb. for cooking, coffee, as a substitute for tea on alternate days, $1\frac{3}{7}$ oz. In most up-country stations mutton is supplied twice a week to the troops; but in Lower Bengal, sheep are not so easily procurable. An inspection of the constituents of the ration is made by the orderly officers, and captain of the week, and quarter-master, and one corporal and a private from each company. 2. Fruit does not form a part of the ration; vegetables always do, according to season. Breakfast is taken at 8. 30 a.m., dinner at 1 p.m., and tea at 5 p.m. The men generally take coffee early in the morning at their own expense. At this station the mangoes grown in the Government park are given to the European soldiers gratis, and are much prized, although the quantity is small in proportion to the large number of recipients. 3. Fish in many stations might be allowed; a larger and more varied supply of vegetables might be supplied if public or soldiers' gardens were successfully encouraged. It is not believed that any portion of the rations is disposed of. 4. The common means of cooking are the native fire-places or chulahs; Grant's cooking apparatus has been experimented with a good deal, but not altogether with satisfactory results. The kitchens at the station are old, small, and ill-ventilated and lighted; the food is both roasted and boiled. The cooking is frequently ill done, particularly for those who require it done the best, namely recruits, who are without experience in such matters. Old soldiers have a more varied cookery; but still there is great room for improvement. Some means of converting recently slaughtered and frequently tough meat into tolerably tender and palatable food is much required. The troops do not usually have tea, coffee, or other refreshments before a march; most regiments send their cooks on ahead, and have coffee prepared at a halting place. 5. I think gardens for the cultivation of vegetables by soldiers might be advantageously established, but the time they can safely work in them is so exceedingly short that a great deal must necessarily be left to native coolies and gardeners.
VII.—DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress and accoutrements at this station consist in hot weather of a suit of cotton dust-coloured clothes—in the cold of the red serge tunic and cloth pantaloons. They have 3 flannel shirts and 2 abdominal belts; a helmet covered with cotton, slightly padded, with a good curtain over the back of the neck. I consider that no improvement can be made in the dress, as it is suited to the climate. On guard the men wear the cotton clothing in summer, and in winter the cloth suit, with woollen socks, flannels, and ammunition boots in wet weather.
Duties.	1. The troops, particularly cavalry, should be drilled preparatory to leaving home, as drilling to the extent that is necessary to make a recruit know his duty often in this climate sends the less robust or less temperate into hospital, when if done in England it would strengthen him. 2. There is a parade every morning during the year, weather permitting; duration about an hour. The men do not suffer in health from drill. In cold weather, the parades are twice a day. The best time for drills and parades in the summer months and in hot weather is before sunrise, and in cold or winter months after. For marches, in the cold weather, early in the morning an hour or two before sunrise; in the hot weather, marching about sunset would be what I should advise. The average number of nights the men have in bed in is 5. 3. Guards are mounted close to barracks at this station; they last 24 hours (from sunrise to sunrise), except mess-guard, which mounts only at sunset. There are check roll-calls day and night, twice at night and twice during the day at uncertain hours.
VIII.—INSTRUCTION AND RECREATION.	1. The means of recreation and instruction consist of a skittle-alley for each company, one school, a good library and reading room, lighted at night, and used as a day-room, or soldier's club; but there are no ball-courts, no soldiers' gardens, workshops, theatre, or gymnasia. There is not sufficient means provided to keep the men occupied during the wet season. During the rains and in the hot season, they are not allowed to appear outside their barracks from 9 A.M. to 6 P.M. 2. The erection of fivescourts, a theatre, gymnasia, swimming baths, the public reading of good biographies, travels, novels, &c., employment at trades of various kinds, and instruction in them to those untaught, clothes, accoutrements, barrack furniture of all kinds to be manufactured in the regiment, watch-making and mending, printing and paper making, bread and biscuit baking, and several other trades might be encouraged, with considerable effect, and prove great improvements. 3. In connexion with workshops for employment as already suggested, savings banks would be still more advantageous than they undoubtedly now are. 4. There is no sufficient shade in this station, but in many others there is far less.
IX.—MILITARY PRISONS.	1. In the military prison at this station there are no cells. The mainguard of H.M.'s Regiment is part of one of the barracks; it is well ventilated and is not usually overcrowded. The same arrangement exists for the prisoners of the Royal Artillery. For the depôt of H.M. Indian army the main guard is a small detached building, low, close, and ill-ventilated. There are no solitary cells.
X.—FIELD SERVICE.	1. I am not aware of any local regulations for field service which are not included in the Presidency Regulations. 2. The suggestions of medical officers are generally attended to by commanding officers, but as far as I have observed they are seldom consulted with regard to the conduct of line of march, troops bivouacking, camping, &c.

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	3. Medical officers are never consulted in the selection of camping grounds on the line of march. Space of ground for encampment is generally set apart at each halting place; at these places there are always good wells; grain, wood, and other bazaar supplies, are stored and supplied. 4. Field hospitals are established when requisite in war time, conducted upon the general principles laid down for the regulation of European regimental hospitals. There is a medical storekeeper for each hospital; and bazaar, and other commissariat stores are supplied on indents; diet and servants are also supplied by the commissariat. A surgeon is appointed in general charge, with as many surgeons, and assistant surgeons, and medical subordinates as may be deemed necessary. Doolies have been found the most comfortable and least injurious vehicles for the transport of sick, and hospital supplies are conveyed on camels, carts, &c. according to circumstances; ambulance carts have occasionally been used, but I have had no experience of them. The general regulations for the establishment of field hospitals are laid down in the Bengal code of medical Regulations. Chapter XXIV.
XI.—Statistics of Sickness and Mortality.	1. There is no information under this head.
XII.—Hospitals.	1, 2, A ground plan, together with a rough marginal sketch of the elevation of the hospital, has been transmitted; it is situated west of the line of barracks, and at a convenient distance from them. The bazaar is about 100 yards west of it; the houses of the station are south of it and lie between it and the river Hooghly. The hospital is open and freely ventilated and unobstructed by high buildings or trees, &c. The site is generally healthy. 3. The water supply is from a good tank close to the hospital, and it is both abundant and generally wholesome. 4. Drains of masonry receive the rains from the roof, the refuse water &c., and convey it into the river. They are open and quite sufficient for the purpose. 5. The hospital consists of a large iron-framed building, 411 feet in length by 38½ feet in breadth; the height at the centre of the roof is 23 feet 8 inches. There is a fine verandah on the south side 11½ feet wide, extending along the whole front, and round the east and west ends. On the northern side, there is no verandah; the floor of the building and verandah is raised on masonry pillars 3 or 4 feet, and is planked over. At the east and west ends there are two rooms, 19 × 18½ feet, used for dispensary and other purposes. The hospital is constructed for 150 beds, 60 on each side, and 30 in the centre between the iron pillars. Air freely enters under the planked floor. There are no division walls, the hospital being one immense hall. The compound or enclosure in which the hospital stands is large, well drained, and cleanly kept, traversed by good drains, and surrounded by a brick and mortar wall 4 feet high, topped to about the same height by an iron wire-netting, sustained by iron posts let into the masonry. These drains are sufficient to carry away all rain and refuse water rapidly. The hospital is built of iron, with single walls, and the roof is of grass thatch. The roof and walls are well constructed and of sufficient thickness. The doors are only closed by jhilmils, they are not glazed. Verandahs are not used for the accommodation of the sick, convalescents, or others. There is one flat only, which constitutes the hospital.

Table of Hospital Accommodation.

Date of construction, 1859.

Total number of wards - - - - - 3

Total regulation number of beds - - - 150

Wards, or Hospital Huts. No.	Regulation No. of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		ft. in.	ft. in.	ft. in.				ft. in.		ft.	ft. in.
3 wards	50	135 2	38 6	10 6 at sides. 3 6 in centre.	90,465	1,809	86	1 6 to 1 11¾	28 windows 12 doors	4 9	2 6 4 6

The hospital is so placed as to receive the benefit of prevailing winds. Venetian doors open out of the hospital wards into the large southern verandahs; corresponding doors are on the northern side, open ventilating spaces also extend all along the roof tree.

6. The above arrangements fully ventilate the building, as it is never close or offensive. The doors are not glazed, but closed with jhilmils or venetians.
7. No means are employed for cooling the air in wards.
8. No means of warming are required. The walls and ceilings of the hospital wards are cleansed and lime-washed annually as a rule, but oftener if required by the medical officer.
9. The privies are behind, and on the northern side of the hospital. Iron urinals, containing charcoal, which are emptied daily, are used. The place is divided into 13 compartments, and is fitted with wooden seats. The soil is at once removed and placed outside cantonments. The filth is cleared away daily in barrel carts; the privies are never long offensive.
10. The lavatory consists of a long room attached to the northern side of the hospital, 30 feet by 12. There are two bath rooms, and one urinary room. They are clean and well ventilated.
11. There is a large full-length wooden and a small hip-bath. Earthen dishes are used for ablution.
12. There are no particular means for washing and drying hospital linen. Dhobies, or washermen, form part of the regular hospital establishment; they wash and dry the clothes, &c., at a distance from the hospital.
13. The storage is insufficient; the bedding and clothing has to be kept partially in the verandahs of the store-room, and gets injured by wet or damp.
14. The bedsteads are of wood of the ordinary size, with iron-hoop bottoms. The bedding consists of native tow, stuffed into coarse cloth; this is easily removed and renewed when soiled, but is apt to get into hard lumps by use.

E BARRACKPORE. BENGAL.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	15. The hospital kitchen is a building divided into two rooms, each 40 feet in length by 12 in breadth, and 11 in height. It is large enough for one regiment. It is also close to the hospital and sufficiently convenient and adapted for hospital requirements. 16, 17. An hospital serjeant is provided for attendance on the sick, also a sick orderly, generally the patient's comrade, when the case is serious; there are beside native hospital ward coolies for general attendance upon the sick, and these are increased in proportion of one to six men when numbers increase. A female native nurse and a female native sweeper is provided for a regimental hospital, and increased as occasion may demand for attendance in the female hospital. 18. The European hospital here is a good one; no epidemic disease, pyæmia, or hospital gangrene has ever appeared in it. 19. The hospital requires better store rooms for clothing and bedding, detached rooms for infectious diseases, insane or delirious patients, ophthalmic cases, &c. The cook house is also too small. At present a private house in the vicinity is rented for a female hospital; it is in several respects unsuitable, and a female hospital is desirable. 20. Except the large verandah to the south there is no special provision made for convalescents taking exercise. Weakly men, on the requisition of a medical officer, are taken out for air and exercise on government elephants, and when the weather is cold it is not unusual to send out convalescents under non-commissioned officers for a morning and evening walk. 21, 22. There are no special local hospital regulations. 23. The medical officer has practically complete power in matters of diet, comforts to sick, &c., and also in hospital repairs, when he can show that they are essentially necessary for the benefit of the sick. 24. There are no convalescent wards or other extra accommodation in the hospital, and I can see no very clear advantage from such accommodation.
XIII. BURIAL OF THE DEAD.	1, 2. The burial ground used by British troops is in front and on the right flank of the parade ground; the prevailing wind blows from the station over it; its area is from 360 feet by 250 feet, equal to about two acres; in the higher portions the soil consists of a friable alluvium, in part of the lower space it is clayey, and the rest of a sandy alluvium; the drainage is merely surface, through small channels left in the wall that encloses the ground. During the rains, the ground in the lower part is thoroughly permeated with water, so that open graves are nearly filled, and that by water to a certain extent polluted by the adjacent graves. Decomposition seems to be rapid in its progress, and there is no desiccation. 3. The grave space is six feet long by two feet wide, and from one to two feet between graves in the dry season, but in the rains more than double these dimensions have to be allotted, or the graves kept ready dug would fall in; they are from 4½ to 5 feet deep, and are never re-opened for fresh interments. There is no regulation as to the time allowed for interment after death. In India, if the death takes place in the morning the interment takes place the same evening, if later in the day the following morning is appointed. 4. Since the occupation of the station by European troops the burial ground has occasionally been very offensive, especially in the height of the rains. In sickly periods it is necessary to have several graves ready before hand, and in the rains these become filled with water, not merely surface water, but from the porous nature of the soil, by which there is a perfect communication between all the subterraneous fluids, and there is consequently a pollution of the water in the open graves by contiguity with the corrupting contents of the closed ones. In the dry season this is not felt, in the wet season it can scarcely be avoided. The regimental surgeon names the hour at which the burial shall take place, and puts it on his death report, a copy of which is sent to the chaplain or priest, and one to the commanding officer. 5. Some of the dead of the camp followers and bazaar people are buried; the greater number, being Hindoos, are burned, or scorched and thrown into the river. 6. No injury accrues to the public health by the present practice. 7. A new burial ground on the left flank of the parades, and in a suitable position closer to the European hospitals. The one now in use has been examined, and is about to be enclosed.

(Signed) J. B. HEARSEY, Major-General,
Commanding Presidency Division.
F. ANDERSON, M.D.,
Officiating Deputy Inspector General,
Barrackpore Division.
J. ELIOT, Captain, Executive Engineer,
Barrackpore Division.

Date 2 July 1860.

EXTRACTS of a LETTER, No. 3616, dated 27th July 1861, addressed by the QUARTERMASTER-GENERAL of the ARMY, BENGAL PRESIDENCY, to the OFFICER COMMANDING PRESIDENCY DIVISION, having reference to QUESTIONS not properly answered on the SANITARY STATE of the INDIAN ARMY for the STATION at BARRACKPOOR.

Sanitary Condition of Station.
Further Answer, vide *letters annexed.*

17, 18. The remedy for these evils seems to be with the local authorities, and I request you will inform me whether the drains could not be kept open and the jungle cleared away if bildars were employed whenever found necessary. Other stations in this country are drained in a similar manner without any pernicious results being experienced.

Military Prisons.
Further Answer, vide *letters annexed.*

1. Are no better arrangements being made for these prisons, and are no other buildings authorized for guard rooms, prisons, and cells than those referred to in the reply, which seem unsuitable in every way?

Hospitals.
Further Answer, vide *letters annexed.*

21. I beg you will inform me if the want of a proper building near the European hospital for female patients has ever been brought to the notice of Government in the Public Works Department.

Hospitals.
Further Answer, vide *letters annexed.*

19. Are any arrangements authorized, or have any been recommended, by the local authorities for increasing the store rooms?

HEN. ROBERTS,
Major, Deputy Assistant Quartermaster-General of the Army.

References to Subjects and Queries.	Replies.

To Captain MAXWELL, Deputy Assistant Quartermaster-General, Barrackpore Division.

No. 350.

SIR,

Sanitary Condition of Station.

17, 18. IN reply to an inquiry of the Quartermaster-General of the Army, conveyed in his letter No. 3616, dated 27th ultimo, respecting the open cutcha drains of this station, I have the honour to state that about a dozen coolies having, at the commencement of the rains, been put on, and paid out of the Grazing Fund, the drains are now kept free of vegetation and falling leaves.

Hospitals.

19. With respect to the European hospital store rooms, I have to remark that since the date of my observations on the subject, in reply to the questions of the Royal Sanitary Commission, the recruit depôt hospital has been removed into another building, and the store rooms for clothing and bedding and the cook house afford now sufficient accommodation.

21. A female hospital is certainly desirable, if the women of the regiment, battery, and depôt, are to be with their husbands in the customary proportion. When the European hospital was first built there were no women and children with the troops at this station, and the want of a female hospital was not then felt.

Two rooms of a small size for cases requiring to be detached would also prove a most desirable addition to the large European soldiers' hospital.

F. ANDERSON, M.D.,
Officiating Deputy Inspector-General of Hospitals.
J. B. HEARSEY,
Major-General Commanding Presidency Division.

Deputy Inspector-General's Office, Barrackpore,
August 14, 1860.

From the EXECUTIVE ENGINEER, Barrackpore Division, to the DEPUTY ASSISTANT QUARTERMASTER-GENERAL, Presidency Division, Barrackpore.

No. 220.

SIR, Barrackpore, August 16, 1860.

Military Prisons.

1. WITH reference to the inquiry made by the Quartermaster-General of the Army in his letter, No. 3616, dated 27th July 1860, regarding guard rooms, cells, and prisons at this station;

2. I have the honour to state that the small barrack in which the quarter-guard of Her Majesty's 6th regiment is located is specially for that purpose, and is not a portion of the accommodation of the men.

3. With reference to the artillery and depôt, I some time ago reported that *neither* has any of the subsidiary buildings allowed. I imagine the delay in giving orders on the subject arises from the uncertainty as to the permanency of the location at this station of these two bodies, one letter from the Quartermaster-General, dated 19th September, last year, stating that it was not necessary to have any artillery here, and the last distribution of troops in this division, stating that half a battery should be here.

4. The Quartermaster-General's and Deputy Inspector-General's letters are herewith returned.

J. ELIOT,
Captain, Executive Engineer, Barrackpore Division.
J. B. HEARSEY,
Major-General Commanding Presidency Division.

To the QUARTERMASTER-GENERAL of the ARMY, Head Quarters, Presidency Division.

No. 823.

SIR, Barrackpore, August 23, 1860.

No. 350, dated August 14, 1860, from the Officiating Deputy Inspector-General.
No. 220, dated August 16, 1860, from the Executive Engineer.

WITH reference to your letter, No. 3616, of 27th July, drawing attention to certain remarks made in the questions and answers issued by the Royal Commission on the Sanitary State of the Indian Army, I have the honour to forward the information called for in the accompanying letters, as per margin, from the Deputy Inspector-General of Hospitals and the Executive Engineer of the division under my command.

J. B. HEARSEY,
Major-General Commanding Presidency Division.

DUM DUM.

Accommodation	European Troops	Artillery	1 battery.
		Cavalry	200
		Infantry	1 regiment.
	Native Troops	Infantry	200

References to Subjects and Queries.	Replies.

I. TOPOGRAPHY.

1. The country surrounding the station is fertile and rice-producing, with numerous villages, embosomed in thick woods of bamboo, mango trees, banian, tamarind, and other large tropical trees. The country is flat, the soil parched and dry in the hot weather, and swampy during the rainy season. There is much wood, not jungle, in the vicinity, and plenty of water.

2. The station is 18 feet above the level of mean tide, and 9 feet only above spring tides, while during the months of June, July, August, and September, the south-west monsoon, causing the water in the Bay of Bengal to rise 7 feet, places Dum Dum only 2 feet above the level of high flood tide. The ebb and flow of the tide is then visible in the ditches in the immediate vicinity of the station. The sea is 84 miles distant. The nearest lake is the Calcutta Salt-water Marsh, the closest point of which is 2 miles south of the station.

DUM DUM. BENGAL.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	The marsh is 9 miles long and 4 miles broad. The nearest river is the Hoogly, 3¼ miles in a westerly direction. The nearest canal is the Calcutta Circular Canal to the south-west, and the nearest Nullah is the Noweye nullah, 2½ miles in a north-easterly direction. There is no higher or healthier ground adjoining the station.
	3. The nearest mountain is the hill of Parisnath, 121 miles distant, with an elevation of 4,463 feet above the sea. It is on the grand trunk road leading to Benares, and accessible at all seasons. The temperature on the summit is fully 12° F. lower than that of Calcutta; delicious water is found close to the top, and it seems very desirable to carry out a plan now in contemplation, of establishing there a small sanitarium for soldiers serving in the immediate part of India. The table-land at the foot of Parisnath stands 1,000 feet higher than this station.
	4. As but little rain flows off, the vicinity of the station is under water during the whole of the months of July, August, and September. There is no broken ground, or ravines, or water pits near the station.
	5. The station is tolerably open and exposed to the monsoon winds, but, perhaps, some portion of the houses, with gardens and hedges, owned and occupied by natives in the vicinity, might with advantage be cleared away. None of the houses inside cantonments interfere with the ventilation. The temperature of the air in the immediate vicinity of the barracks is raised somewhat by reflected sun's rays, but certainly not the temperature of the station generally. The station, as a general rule, is not exposed to cold or variable winds, but is under the influence of the N.E. and S.W. monsoons; the latter is the sea-breeze; neither have any prejudicial effect on health.
	6. The surrounding country is highly cultivated. There are no works of irrigation in the neighbourhood, but the rice crops are under water for several months. The cultivation of rice is prohibited within the limits of the cantonment, but is permitted up to the boundary pillar, all round the station; the land being private (native) property and in no degree subject to military authority. Neither indigo, hemp, nor flax are cultivated in the vicinity.
	7. The nearest large city is Calcutta, about seven miles distant, but an extensive native population exists in the immediate vicinity of the station.
	8. As regards the geology of the district, Dum Dum is situated upon the great Gangetic Delta. The soil is alluvial, and has been pierced to the depth of 480 feet, showing the following sections:—

Surface soil	10 feet.	Sand	120 feet.
Blue clay	25 „	Clay	159 „
Peat	80 „	Sand	480 „

	The ground occupied by the station was not previously the site of a village, but was covered with jungle.
	9. Water is found at a depth of 9 feet during the dry season, and 1 foot during the rainy season.
	10. There are no surface springs in the district. The rain-fall is very partially drained away, the greater portion being absorbed in the very porous soil of the Delta. Much is evaporated and none oozes out after absorption in the ground.
	11. The water supply for the station is derived from wells and from open tanks; the extent of tank surface being as much as 25 acres within the station. I am unable to state the extent of tank surface within half a mile round. Some of the tanks have water in them all the year round, but many of them get dried up before the month of April, and there is often a dearth of water just before the rainy season commences. No tank used for drinking water by Europeans is also used for bathing. Both tanks and wells are liable to suffer from leaves falling into them at certain seasons, and require to be cleaned out from time to time; but no foul drainage or surface impurities are allowed to drain into tanks containing drinking water. No nuisance nor malaria, so far as I am aware, proceeds from any tank here, or in the immediate neighbourhood.
	12. The amount of water-supply available for the station is abundant, and it is generally clear, well tasted, and free from any particular smell. The following is its chemical constitution:—

Tank Water.

In 40 oz. there are:—

Solid residue	2·8 grains.
Silica	0·2 „
Earthy carbonates	2·0 „
Alkaline chlorides with a small quantity of alkaline sulphates and carbonates, and a trace of organic matter	0·6 „

Well Water.

In 40 oz. there are:—

Solid residue	6·6 grains.
Silica	·8 „
Earthy carbonates	1·8 „
Alkaline chlorides	0·8 „
„ sulphates	0·3 „
„ carbonates and trace of organic matter	2·9 „

	The waters are filtered before analysis. It is not in my power to state the microscopic characters of the water. It is generally soft, but the well water contains a considerable quantity of silica. I consider the water-supply sufficient and not injurious to health. It is raised and distributed for use by native water carriers in leather bags. No better water-supply could be obtained. I think as a general rule all tank water ought to be filtered, and in each barrack there should be several common filters, which should be carefully looked after. Such filters are used in hospitals always, generally in barracks; but they should be made imperative, and some one should be appointed to attend to them.
	13. I am of opinion that rice culture is permitted too close to the station on all sides; but, of course, beyond the cantonment pillars the officer commanding here has no power to prevent the owners of the soil from planting or sowing what crops they will. Much of the land would be under water during the rainy season under any circumstances.

References to Subjects and Queries.	Replies.
Topography—*cont.*	14. The manner of selecting sites for stations varies very much in different cases, the opinion of medical men being frequently totally disregarded. In this very station, and at Barrackpore, barracks have been built within the last two years without ever consulting the medical authorities; and very recently at Dum Dum entirely new arrangements were made regarding all the hospitals, by a committee not containing a single medical officer in its number, and the reports were sent in to the Commander-in-Chief without the result of the Committee's deliberations being even communicated to the Inspector-General of Hospitals, or the Deputy Inspector-General.
II. Climate.	1. The only meteorological instruments supplied by Government are thermometers, and of the thermometer only has any regular register been ever kept.
	2. I am unable to furnish a table of sufficient accuracy to be worth recording. The Calcutta observations may be considered applicable, except that the temperature is 1 or 2 degrees lower at Dum Dum than at Calcutta.
	3. The climate of Dum Dum, as of all Lower Bengal, is very moist. The weather is never very cold as in the north-west provinces, and never so hot, dry, and trying, even in the hot season, as up country. There is a thick mist nearly every morning hanging over the station for a month before the hot season commences. There is no dust at any time sufficient to render the air impure, or other admixture affecting the atmosphere unfavourably. I do not consider the climate as ordinarily unhealthy for troops, if proper precautions are used. The times of drill, &c. must be made to depend on the season here, as in all parts of India; so must the dress used by the men, it being essential that they should wear clothing at night which is utterly unsuitable for the day. I deem it more desirable here than up country that they should sleep in storied barracks, and not on the ground floor, where practicable. The healthiest months are November, December, and January. The most unhealthy from my experience are June, July, and August. Cholera, dysentery, and fevers are the prevailing diseases during the unhealthy months.
	4. There is no district near the station the climate of which is more conducive to health than Dum Dum.
	5. I have served at Gyah, Dinapore, Ghazeepore, Benares, Mirzapore, Allahabad, Mynpoory, Gwalior, Seepra, Augur in Malwa, as well as in Calcutta and at Dum Dum. Not one of them is, in my opinion, absolutely unhealthy, and I consider that Benares, Mirzapore, Mynpoory, Augur in Malwa, and Dum Dum ought all to be healthy for European troops if due precautions are used. Any station will prove unhealthy where too many men are put into the barracks. I consider over-crowding to be the chief cause of disease all over India, and want of attention to drainage.
III. Sanitary Condition of Station.	1. 2. 3. Plans.
	4. Date of construction of permanent barracks { 4 built in 1813–14. 1 enlarged and added to, 1858. 1 built in 1858–60.
	Total regulation accommodation, non-commissioned officers and men—1,649.

The following Table gives the details:—

Barrack Rooms.	Regulation Number of Men per Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
Number of Rooms in five permanent Barracks.		Ft.	Ft.	Ft.	Ft.					Ft.	Ft.
6 - -	33	107½	22	14	33,110	1000·1	71⅔	18 in.	16	8	4
3 - -	33	101	22	15	33,330	1000	67	"	14	"	"
3 - -	36	112	22	15	36,960	do.	68	"	16	"	"
6 - -	35	107¾	22½	15	35,961	do.	68⅔	"	16	"	"
3 - -	33	101¼	22½	15	33,959	do.	68½	"	14	"	"
3 - -	37	112¾	22¼	15	37,630	do.	67⅘	"	16	"	"
2 - -	33	106½	22	14¼	33,387	do.	71	"	16	"	"
1 - -	35	111¾	22	14¼	35,033	do.	70⅕	"	16	"	"
1 - -	31	100	22	14¼	31,350	do.	71	"	14	"	"
2 - -	37	107	22¼	19	45,742	1,236	64	"	16	"	"
1 - -	38	112¼	22½	19	47,986	1,263	"	"	16	"	"
1 - -	34	100½	22½	19	42,964	1,263	"	"	14	"	"
2 - -	53	171¼	22	14¼	53,686	1,000	"	"	28	"	"
1 - -	149	434⅜	22½	18⅓	179,334	1,270	"	"	58	"	"
12 - -	Sergeants' quarters, Store-rooms, &c.	25	22	14	7,700	—	—	—	—	—	—
2 - -		34	22	18	13,464	—	—	—	—	—	—
2 - -		11¼	12¼	18	2,480	—	—	—	—	—	—
2 - -		24	12¼	18	5,292	—	—	—	—	—	—
Iron-framed Barrack One Room - -	209	469¾	28½	18 8/10	251,692	1,204	64	—	doors 56 windows 106	9½ 5½	5 3½
Riding School - -	198	198	48	19	180,576	1,220	64	—		—	—
Main Guards -	13	18½	11½	15	3,191	1,000	64	—	2	8½	4½
		18½	27	15	7,492	1,000	71	—	5	8½	4½
		18½	11½	15	3,191	1,000	71	—	2	7½	5
Hospital " -	8	27½	17½	18	8,662⅔	1,083	60	—	12	8	4
Magazine " -	11	36½	17½	18	11,551½	1,050	58	—	—	—	—
Prison Cells, 26 - -	1	16	7	12½	1,520	1,520	112	—	—	—	—

DUM DUM. BENGAL.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides of the rooms. The lower portion of each window to a height of 2½ feet is not provided with hinges, but fixed to the window frame. The upper 5½ feet portion opens on the outside in two leaves. All the permanent barracks have verandahs on both sides; 12 feet wide and 15 feet high in the old barracks; 12 feet wide and 18 feet high in the new barracks. They are closed outwardly by venetian windows opening outwards. There is a series of open arches between each verandah and the centre room or ward. The verandahs are supposed only to be used for the men to take their meals in, the centre room being reserved for sleeping. But practically the verandahs (one at least) are too often used for sleeping in, owing to want of room in the centre ward, and the inevitable consequence of such crowding is an outbreak of sickness. The jalousies or jhilmils are properly constructed, and of exactly the same kind as those used by officers and civilians in India generally. 6. Wooden cots are used in barracks. Each soldier has issued to him one cotton settringee (a carpet) the size of the cot; 2 cotton sheets; 1 quilt of double chintz, 7 feet 4 inches by 4 feet 9 inches, and one good country blanket, to measure when double 7 feet 4 inches. 8. For ventilating the barrack rooms, besides opposite doors and windows, there are close to the ceiling of all the lower stories circular holes 9 inches in diameter, both in the interior and exterior walls, and round each beam a space is left to assist in carrying off the foul air. In the upper stories regularly constructed ventilators, with glass windows capable of opening, are placed at short intervals all along the roofs of the new barracks. Those in the old ones are tiled louvres. But there are in addition holes 2½ feet in diameter pierced about every 40 feet all along the roof in the verandah, and covered over with earthenware pots (gumlahs); between the latter and the roof the heated air escapes. The ventilation was quite insufficient, especially at night, when the barracks were overcrowded; but with the numbers who have lately occupied them, and are to do so in future, I believe there is no ground for complaint. No special means of cooling the air are used, except ventilating openings and punkahs, which when properly used are a great relief to the men. 9. The permanent barracks are all constructed of solid masonry. The iron framed barracks have walls of masonry outside, and are roofed with a thin layer of thatch (6 inches), covered with the common bazaar small tile. All these buildings leak badly, but there is reason to suppose that either a proper thick thatch or larger tiles of an improved character will eventually be substituted. 10. The floors of the permanent barracks are raised 3 feet, and are formed by laying 1½ feet Chunar stones over flues of brick work. The air passes through the flues, iron gratings being placed on each side to prevent the entrance of animals. The iron-framed barracks have floors of wooden planking well raised, like the former, and on arches, with iron gratings also to keep out animals. There is thus a free passage of air beneath. 11. As regards character of materials, the present roofs of the iron-framed buildings are, as stated above, totally insufficient, but may be improved. I think it would be advantageous to have wooden flooring elsewhere in place of tiles or flags, but frequent repairs of portions will be required. The Barrack Master performs all petty repairs, and applies for the aid of the Executive Engineer when any new work is required. Repairs are executed with fair celerity. The senior Medical Officer at the place is ex-officio sanitary officer, and it is his duty to report to the commanding officer whatever he sees amiss, and also to make suggestions. The commanding officer is responsible to the higher authorities, and under him the barrack and conservancy departments. Walls and ceilings are repaired and whitewashed once a year by the Executive Engineer. But the Barrack Master may at any time be called upon to whitewash the walls to the height of 6 feet, if necessary as a sanitary measure. 12. There are lavatories supplied with water from stop cocks (there appear to be no baths.) Metal basins are used for washing. 13. The cookhouses are fitted up on one side with a number of little walls parallel to each other, 1 foot high and about 4 inches broad, placed together so as to allow a kettle, pot, or pan to rest on the edge of each, while the fire is lighted underneath. Water is supplied by water carriers, and a drain runs all round the building to carry away the refuse water. The pans are of copper, and are tinned on the 1st and 15th of every month; if this is not carefully done, they are apt to fall into a dangerous state. A large tank is set apart for washing linen, which is done by washermen, dried in the sun, and prepared by the washermen at their own homes. There is plenty of washing and drying room. 14. The privies consist of iron pans, the contents of which, together with the urine from cesspools connected with the urinals, is carried away daily in covered carts, and buried outside cantonments. 15. The means of lighting the barracks at night are sufficient. 16. There are no covered sewers for draining the barracks. All the drains are open, and vary greatly in breadth and depth. They are all at a distance of 6 feet from the walls of the buildings, the interval being a tiled platform, sloping towards, and joining the drain. The whole of the drainage passes by the main station drain into the salt-water marsh. The drains are not defective, but the fall is so slight that in the rains especially, the surface water and the drainage from the men's lavatories are not readily nor efficiently carried away. The drainage from cookhouses, privies, and urinals is removed daily in filth carts, as already stated, and buried in pits outside the station. Every privy has a cesspit about 2½ feet in diameter and about 5 feet deep, lined with solid masonry, and having a wooden cover. None of them is within 70 yards of a drinking tank or well. The floors of most of the under stories of the barracks are damp, particularly in the rainy season. This is owing chiefly, I believe, to the large quantity of moisture absorbed by the Chunar flagstone, of which the flooring consists. It is to be regretted that the floors were not made a foot higher from the ground than they are. 17. A cart and men are maintained about the station to keep the surface clean, &c. A separate cart goes round the officers' quarters. The cleansing has been effectually done of late. Up to the end of the last rains, the conservancy was totally unequal to the wants of the cantonment.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	18. By this agency the surface is kept free of vegetation, but additional aid will be required for the purpose during the rainy season. 19. The bazaar is not crowded, and there is nothing to complain of as to drainage, ventilation, cleanliness, or water-supply. A cart and six sweepers are kept up for the bazaar, and go their rounds regularly morning and evening. The sanitary state of the bazaar generally is satisfactory, but I would make vaccination compulsory on every resident old and young. The native houses generally near the station are kept pretty clean and have no dung heaps nor cesspools within them. No nuisance is experienced from wind blowing over native dwellings. 20. Only one slaughtering place is allowed, about half a mile to the south-west of the station. It is a thatched structure, but a solid masonry one has been sanctioned. No nuisance proved from the present one. The offal is chiefly disposed of with great rapidity by beasts and birds of prey. The remainder is carted off and buried. 21. There are very few bazaar horses which are picketed behind the houses of their owners. Refuse straw and grass are burned and dung is carted away. 22. Stables lately occupied have been temporary ones only. The proper picketing ground for artillery and cavalry horses is about half a mile from the hospital to the north-east, and more than a mile from barracks. 23. There are no regular married quarters. Either a barrack is divided for them into sets of temporary quarters, or, if under the same roof with unmarried men, the quarters are completely separated from the latter. I have never known married people occupy the barrack rooms with unmarried men.
Officers' Quarters.	1. The officers live in detached houses, all in satisfactory sanitary condition. The most desirable houses are those with upper stories, but there are only few of them.
IV. Health of the Troops.	1. I consider the station as healthy for European troops so long as they are not crowded in barracks, and other measures of precaution are observed. The native population here, as in other parts of Bengal, suffer much from sickness in the hot weather and end of rainy season. 2. The most prevalent diseases among the native population are small-pox and cholera in the hot weather, and fever, often accompanied with spleen disease, in the end of the rains. Cholera is now endemic in this part of the country, and has been epidemic this season, carrying off thousands all over Lower Bengal. 3. As regards small-pox much requires yet to be done to propagate vaccination. As regards fever and cholera the lowness and dampness of the native huts, affording as the huts do, insufficient protection from the rain, must be considered the great causes of sickness. Also the poorness of their food, eked out occasionally with insufficiently cooked vegetables, and fish in a state of putrefaction. 4. The troops at the station are young recruits from England, or time expired soldiers, or invalids from all parts of India, except a battery of Royal Artillery, which arrived here a few weeks ago in excellent health. I consider all the permanent barracks at this station as about equally healthy. Certain temporary barracks, which were occupied by troops last year, proved to be in the last degree unhealthy, owing to defective ventilation, leaky roofs, and insufficiently raised floors. But having been condemned by all the Medical Officers, these barracks will, it is understood, be pulled down or converted into stables. The lower stories of all the permanent barracks are more or less damp, and therefore not so healthy to live in as the upper stories. 5. Troops are not usually camped out. 6. 7. I have never been in charge of troops at hill stations. 8. From what I have seen of the beneficial change produced in the health of officers by a residence in the hills, and judging from the appearance of soldiers after being some time at a hill station as compared with their looks in the plains, I highly approve of selecting hill stations for troops. 9 to 13. (Hill stations.) No experience. 14. As regards change of station on the plains, when a regiment is healthy and the amount of duty moderate, I see no good to be gained by frequent change of station, that is, more than once in 2 or 3 years; but when a regiment has suffered much from sickness, and the men get out of spirits, they should be moved at the end of the year, or even earlier in particular cases. 15. 16. No experience. 17. There is no ground near the station that could be occupied as a hill station. 18. I have not arrived at any positive conclusions as to the comparative healthiness or otherwise of particular soils or subsoils. 19. The best age for a soldier proceeding to India is from 21 to 24 years. The best period for troops landing in India is November and December. Troops landed between 1st April and 31st August are certain to be decimated by sickness. On landing, some recruits are sent up country at once, while others are detained here for a considerable time. During the last 3 years the station has been so crowded at times that it was not possible to observe any general rule, and men were put up in the best way possible, and suitable clothing supplied as soon as possible. On landing, men should be put at once under charge of officers and non-commissioned officers who know the country. They should be strictly confined to barracks during the heat of the day, and prevented from poisoning themselves with unripe fruit and vegetables, and country liquors in the bazaars. They should also have suitable clothing immediately. 20. With reference to the question, as to whether recruits should be sent direct to India or not; as far as regards recruits merely, if thoroughly drilled at the home depôt, I think they may just as well be sent direct to India, provided it is so arranged that they arrive at the proper season of the year. With respect to entire regiments, it would probably be advantageous to send them for a time to an intermediate station, perhaps to the Mediterranean. If landed at the proper season, the sooner recruits are sent to their respective regiments the better. They will be better cared for there than at any depôt in the hills, or elsewhere. As regards entire regiments, sending them to the hills in the first instance might have the same effect as sending them to an intermediate station like the Mediterranean.

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References to Subjects and Queries.	Replies.
IV. Health of the Troops—*cont.*	21. Troops proceeding to the interior from the port either march by daily stages of about 10 miles each, or are transported by steamers as far as Allahabad (500 miles), whence they march, or they are sent 120 miles from Calcutta by railway, and thence in covered carts, drawn by relays of bullocks, 26 miles in 24 hours, travelling only by night, and resting during the day in specially constructed barracks at each resting place. At each such place there is a Commissariat Officer, who serves out the rations as soon as they arrive. There is also a Medical Officer, to attend to any who are sick. In a year or two more troops will be conveyed by the railway to all stations of most importance. When sent up country by steamer, more care should be taken than is often shown, to prevent overcrowding. 22. I think 10 years should be the utmost limit of a soldier's service in India. Men of strong constitution, however, if after that period allowed to visit Europe, and do duty at the home depôt for a year or two, might return to India, and do a few years more valuable service. 23. As regards medical boards, differences of opinion do arise at times, and cause great inconvenience. But, on the whole, I think boards act harmoniously, and, admitting the evils of the existing system, I am not prepared to suggest a better. 24. The best season for the embarkation for England of the bulk of invalids seems to be from the middle of February to the 15th March. But, in cases of fever, dysentery, &c., occurring in patients at stations near the port of embarkation, many lives may be saved by immediate change to sea, whatever the season of the year.
Diseases.	1. Health inspections are held not less frequently than once a week, either in the morning or just before sunset. 2. There is no scorbutus at this station. 3. Not prepared to give a definite reply as to the amount of hepatic disease, as the men are recruits. The things to be principally guarded against for diminishing the frequency of this disease are exposure to the sun and the drinking of ardent spirits. 4. Dracunculus is very rare here, scarcely ever among Europeans. Drinking, and bathing in shallow tanks, at the end of the rains, appeared to have produced the complaint in cases of native soldiers, which I have seen in Central India. 5. Comparatively few of the patients treated here for venereal disease have contracted it at this station. But here, as at other places, it seems highly desirable to establish Lock Hospitals. 6. The prevailing epidemic diseases are, common continued fever, in the hot season and rains; remittent fever and various types of intermittent fever later in the season. The troops suffer much, and often with great severity, from dysentery, acute and chronic. Many men die of it every year. Sporadic cases of cholera occur at all seasons, and the disease is very apt to become epidemic, when the strictest rules for preserving health are not observed, especially on first arrival in the country. Small-pox is rare among Europeans. Soldiers often suffer from rheumatism in the latter part of the rains, especially if sent on night duty insufficiently clad. As regards the proportions borne by these diseases to the total diseases, taking the average of the last two years, among the men under my medical charge (Bengal Artillery Recruits), the admissions from fever, bowel complaint, cholera, small-pox, and rheumatism conjointly were 57·23 per cent. of the total treated, and the deaths 98·95 per cent. of the total deaths from all causes. The following table gives the particulars for each disease :—

	Admissions, Per-centage.	Deaths, Per-centage.
Fevers	29·89	6·25
Bowel complaints	15·96	26·04
Cholera	10·22	66·66
Small-pox	none.	none.
Rheumatism	1·14	none.
	57·23	98·95

There was, however, a severe epidemic of cholera in the second year.

7. The nosological characters of these diseases differ very much with the seasons. Cholera and common continued fever, with occasional cases of small-pox, prevail in the early part of the hot weather. Remittent and intermittent fevers occur mostly in the rainy season, particularly in the latter part of it. Last year we had a violent epidemic of cholera in the month of August.

As a general rule cholera shows itself in seasons of great drought, and so does common continued fever. The other types of fever, again, are most severe where the fall of rain has been above the average. As a general rule I have observed that seasons in India are unhealthy generally whenever the fall of rain is considerably above or below the average.

Excepting that the native houses are insufficiently raised from the ground, and at best usually made of very flimsy materials, there is little to say against their sanitary condition. They are often too crowded and the prejudices of the natives lead to the direct propagation of any epidemic which may occur. As stated elsewhere, natives live very poorly, especially in this part of Bengal, and huddle together so as to be predisposed to catch any disease that prevails.

8. Special precautions require to be adopted for each particular epidemic. When any such prevails, more than ordinary attention must be paid to the soldier's food and clothing, and the degree of exposure to the weather to which he is subjected.
9. Small doses of quinine as a prophylactic have been used in particular cases and found useful, but have not been administered to the troops here generally.
10. As a means of preventing or mitigating epidemic disease at this station, the great object is to prevent crowding, and to have as many men sleep in the upper story of the different barracks as possible.

V. INTEMPERANCE.	1. The soldiers at this station are usually temperate. There are not many confirmed drunkards; but I am unable to state the proportion. 2. I am unable to state accurately the proportion of diseases arising from intoxication, but among the Bengal Artillery recruits during the past year, out of a total of 850 admissions from all causes, there were 2 from delirium tremens and 10 from ebrietas. Drunkenness *per se* is punished as an offence.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	3. Spirits are sold both at the canteen and bazaar, the latter being often of a most injurious description and frequently drugged; sometimes with datura. It is not however permitted to sell spirits in the bazaar to European soldiers, and the person doing so is subject to heavy punishment; still it is done. Spirit never forms part of the ration, either for healthy men or convalescents, and it is not a habit among the men to take a dram before morning parade. Quantities of noxious trash used to be sold in the bazaar under the name of ginger beer and lemonade. I have traced many cases of bowel complaints directly to the use of such drinks. Trash was likewise often hawked about the barracks early in the morning under the name of coffee, which was most prejudicial to health. The consumption of spirits by troops or convalescents is injurious to health. It is most prejudicial to discipline. 5. Spirituous liquors are no longer issued as part of the rations. The soldier has to pay on the spot for all liquor of whatever sort he gets in the canteen. I think the sale of spirits should be totally abolished in the canteen and bazaar. 6. I am convinced that the more the use of malt liquor or wines can be substituted for spirituous liquors, the better it will be for the health of the men. The moderate use of malt liquor, and in some cases wine, I believe to be most beneficial in many instances. 7. Coffee, tea, soda water, lemonade, and ginger beer are much used at the station, the two latter in the bazaar of inferior quality. All can be had good at some of the canteens. The use of such drinks when good of their kind is likely to be beneficial so long as it really causes a diminution of the quantities of spirits and malt liquor consumed. But men and women too, newly arrived in India, are apt to drink too much both of one and the other. 8. I believe it would be beneficial to suppress the spirit ration where it is still issued, and to substitute beer, tea and coffee, the latter of good quality, which at present is often very much the reverse when bought by the men from hawkers irresponsible for what they sell. Old soldiers do not purchase such stuff, but recruits new to the country are readily imposed upon. 9. It would be decidedly advantageous to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, coffee, tea, lemonade, &c. to be sold, exceptions being made in special cases. At the same time the spirituous liquor sold in the canteen is harmless when compared with the native spirits, always too easily procurable in the bazaars, and until very lately in Dum Dum perhaps above all other stations, excepting Fort William. No native grog shops should be permitted within four miles of any cantonment, and the penalties on selling it to Europeans should be made very heavy. 10. As is already the practice in the provisional battalion, I should insist on having really good tea, strong coffee, and wholesome lemonade always available at the canteen. They should not be allowed to be sold in the bazaar except, perhaps, by one or two specially licensed natives, who should be liable to very heavy fines or imprisonment if guilty of selling inferior qualities. Some such rule does exist here, but it is not carried out with sufficient rigour in all cases. 11. The more important canteen regulations are the following:—Canteen open daily from 12 noon to 1 p.m., to issue malt liquor only (1 imperial pint per man), and again from sunset till gunfire p.m., for the issue of rum and malt liquor. No country-made liquor except that issued by the Commissariat is allowed. Rum is sold at 1 anna (= $1\frac{1}{2}d.$) per dram, and malt liquor at $1\frac{1}{2}$ anna (= $2\frac{1}{4}d.$) per imperial pint. No one is allowed more than two pints of malt liquor daily; the second pint being issued after sunset, and one dram of spirits, or two drams of spirits and no malt liquor. Malt liquor to the extent of 1 imperial pint per woman may be taken from the canteen, at the dinner-hour only, for the wives of soldiers who obtain permission to receive it from the Commanding Officer. No person admitted to the canteen but men of the regiment, and gambling entirely prohibited. There do not appear to be any bazaar regulations peculiar to Dum Dum.
VI. Diet.	1. The following is the ration for European troops of the Indian army:—

Bread	1 lb.	
Rice	4 oz.	
Sugar	$2\frac{1}{2}$ oz.	
Coffee	$1\frac{3}{7}$ oz.	alternately.
Tea	$\frac{5}{7}$ oz.	alternately.
Salt	1 oz.	
Fuel	3 lbs.	
Meat	1 lb.	mutton 4 times a month, beef at other times,
Vegetables	1 lb.	potatoes commonly; when scarce or bad, some native vegetable is substituted.

The Quartermaster and Officer of the day both inspect the rations every morning, and are responsible for their quality. The Commanding Officer and Surgeon inspect both these and the cooking apparatus from time to time.

2. A complete ration as above is provided for the troops at this station.
The soldier commonly takes three meals a day: breakfast about 8 a.m.; dinner between 12 and 1 p.m.; tea at 5 p.m. Most of them have a small portion of their allowance of meat dressed for breakfast, while some purchase eggs, and keep all the meat for dinner.

3. I think it would be an improvement in the rations if mutton could be given more frequently. The quantity of animal food seems rather too much, and I am of opinion that it would be better if once a week the men were allowed only good broth, with extra vegetables and bread. The soldier here never disposes of his rations.

4. The kitchens generally are pretty clean, light, and sufficiently ventilated, and are supplied with water by water carriers. The cooking arrangements have been already described. Whether the rations are roasted or boiled usually depends on the taste and wishes of the men. Where there are old soldiers, the cooking is tolerably good and varied. Men of less experience do not fare so well. Tea and coffee when served up are often not so good as they should be: the servants often managing to elude observation, and purloining some

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References to Subjects and Queries.	REPLIES.
VI. Diet—*cont.*	of what is given them to prepare. It is impossible to have good tea while it is all boiled in one great cauldron. Before march men often have tea or coffee; but much depends on the Commanding Officer and Surgeon of each particular regiment. 5. I do not think the climate of this part of Bengal admits of soldiers' gardens being established for the cultivation of vegetables.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements are exactly the same as in England, excepting that during six months in the year they wear Khakee tunic and pantaloons (cotton) in place of cloth. I think the present dress is quite suitable to the climate when common discretion is used in adapting it to duties and seasons. I have no improvements to suggest. Commanding Officers, however, cannot be too careful in seeing that each soldier has the proper supply of flannel and other under-clothing. The guard dress varies according to the season.
Duties.	1. I am of opinion that it is highly advisable, as regards the health of the men, that they should be thoroughly drilled at home before being sent out to India. When drill has to be learned in this country, recruits are very apt to be ordered out on parade earlier and kept there later than is at all compatible with health. Besides, if they have learned steady and obedient habits before quitting England, they are less likely to expose themselves unnecessarily in the sun when off duty in this country. 2. The usual routine of duties varies with the number of troops. Since coming to Dum Dum I have never known men to suffer in health from drill. For drills, parades, and marches the men should not, if possible, be kept out later than one hour after sunrise, or turn out more than an hour before sunset. There are no general orders here about these. The strength has varied here so much that it is impossible to say how many nights a week the men have had in bed. 3. Guards are mounted at distances varying from 50 yards to half a mile or three-quarters of a mile. The men composing the different guards go on sentry for 2 hours at a time, night and day. Commonly there are 4 roll calls in the day, and 1 at night, the hour being constantly varied. I have however known it necessary to have roll call every 2 hours by night as well as by day, in the case of some disorderly recruits and others, for a week or 10 days at a time. Unless men are sick already when they go on duty, I do not think night guards, if they do not recur too frequently, injure the health of the men, if they are suitably clothed.
VIII. INSTRUCTION AND RECREATION.	1. The means of recreation and instruction consist of a fives court, several skittle grounds, and there is a school with a good schoolmaster. There is at present no proper library and reading room, but it is proposed to have one for the whole garrison. There is no day room nor soldiers' club. One for the garrison is in contemplation. There are no soldiers' gardens, workshops, or gymnasia. There is no theatre, except a barrack room occasionally used. These means are totally insufficient for occupying the men. In cold weather the men have many ways of amusing themselves, but in the hot and rainy seasons, reading, when they can read, is practically their only amusement. A very few work at their trades in barracks as tailors and shoemakers. The men are not allowed to go out in the daytime; the hours to which they are restricted varying with the season of the year. In the hot weather men are forbidden to go outside between 9 a.m. and 5 p.m. Exposure to the direct rays of the sun at this station is invariably detrimental to health, especially in the case of men lately arrived from Europe. 2. As regards improvements: workshops where men could carry on their trades would be a boon to the industrious, and the great success which lately attended the opening of a small museum containing models of various kinds, and specimens of native produce and industry; different kinds of armour, electrical machines, &c., all illustrated by a series of plain, practical, but interesting lectures, seems to show that soldiers are ready to avail themselves of any means of rational amusement in the evening, in preference to spending all their time in the canteen. 3. I think the less money that is put into the soldier's hand the better. Every inducement should be given to him to leave his pay in his officer's hands, and savings banks might be very useful. He should not be allowed to draw for more than a certain limited sum at any one time, unless the captain is satisfied as to the way he proposes to spend it. 4. Excepting a few skittle alleys, the men have no means here of taking exercise during the day in the hot and rainy seasons, and even to reach the skittle alleys they must expose themselves to the sun.
IX. MILITARY PRISONS.	1. The sanitary state of the cells is satisfactory, and I have not observed imprisonment in them to be prejudicial to health. Only some months ago, when the station was full of troops, there were occasionally so many as three prisoners in one cell, which, however unavoidable, was in itself objectionable, Fortunately it was the cold season, and the periods of imprisonment were short, so that no ill effects followed. I have usually found the cells clean and well ventilated.
X. FIELD SERVICE.	Not in a position to answer the questions satisfactorily.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information.
XII. HOSPITALS.	1. Plan. 2. The hospitals are situated about three-quarters of a mile from the permanent barracks, and about half a mile as the crow flies from the temporary barracks, and stables hitherto occupied by the Royal Artillery. The hospitals are at the N.E. of the station; more than a mile from the bazaar, but within one-eighth of a mile of some of the native houses outside cantonments on the north. The site is on the whole open and freely ventilated, and generally healthy.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	3. The water-supply is wholesome, but not abundant, especially in the hot months. An additional well is now being dug, which will, it is hoped, always afford an ample supply in future. 4. The water from the lavatories is conveyed away by the same drains which carry away the roof water. That from the kitchen with other impurities flows into a pit, which is cleaned out daily, and the contents of which, like those of the privies and urinals, is carried off by the filth carts every morning. 5. The wards are raised 3 feet above the level of the ground, and there is a free perflation of air underneath the floors. The roof water is conveyed away in open drains (after reaching the latter through baked earthern spouts) to the main drain out of the station. The drains run all round the hospital, and are constructed on the same principle as those round the barracks. The hospital drains all have a considerable drop where they meet the main drain, consequently the forcing back of the drainage in the station generally does not affect them. As regards materials, one of the hospitals is iron framed, with a covering of thatch. The others have the usual flat "pucka" roof. The roofs and walls are all single, and sufficiently thick to keep the hospital cool. The walls of all, excepting the iron-framed hospital, are of solid masonry. The main hospital has a 12 feet enclosed verandah on each side. So has the female hospital. The native hospital has open verandahs, affording sufficient shelter for natives, but not for Europeans, who have occupied it of late. With the aid of matting, however, the sun is excluded. The iron-framed hospital has at present no outer verandahs, but is to have them added immediately on the east, south, and west sides. The enclosed verandahs are used for accommodating sick whenever the centre wards are full. The hospitals are one-storied buildings, well raised off the ground on brick arches. The following table shows the ward accommodation:— Total regulation number of beds, 390.

Wards.	Regulation Number of Sick per Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
Main Hospital.		Ft.	Ft.	Ft.	Ft.			Ft.		Ft.	Ft.
4 - -	33	119½	22	21	55,209	1,673	78	1½	8 doors	8¾	5
4 - -	8	29	22	15	9,570	1,196¼	78	„	40 windows	8¾	5
8 - -	—	13½	12	15	2,430	—	—	—	—	—	—
4 - -	—	119½	12	15	—	—	—	—	—	—	—
Female Hospital.											
1 - -	15	60	20	19¼	23,100	1,540	78	—	8 doors	8¾	4½
4 - -	2	14	14	19¼	3,773	1,886½	78	—	18 windows	8¾	4½
Verandahs 2 - -	—	57	12	19¼	13,167	—	—	—			
2 - -	—	17	12	19¼	3,927	—	—	—	8 doors	6¾	3½
Native Hospital.											
1 - -	37	144¼	20	13¾	39,668¾	1,072	78	—	16 doors, windows	7½	4½
2 - -	—	12	8	13¾	1,320	—	—	—		6½	4
Verandahs 2 - -	—	149½	8	13¾	16,445	—	—	—	2 doors	6½	4
1 - -	—	20	8	13¾	2,200	—	—	—	4 windows	2¾	4
Iron-frame Hospital.											
1 - -	166	334	39	19·7	256,612	1545·89	78	—	80 windows	5½	3½
6 - -	—	12	12	—	—	—	—	—	40 doors	5	9½

The hospitals are so placed so as to receive the full benefit of prevailing winds.

The jhilmils open outwards, the glass doors inwards, their arrangement and construction being conducive to ventilation and coolness.

6. For ventilation, besides the numerous doors and windows, there are in the main hospital large ventilating skylights, running the whole breadth of the centre ward, at intervals of 20 feet. They are 4 feet high and 6 feet wide, with glass sides, on hinges, which can be opened or closed at pleasure. There is also a sufficient supply of punkahs, which are in constant use from about the 1st April to 1st November.
7. There are no means of cooling the air, except punkahs, which are in use night and day, during the hot season, and afford much relief to the sick.
8. No means of warming required.

The ceilings and walls of the hospital are whitewashed once a year with two coats. The walls, to a height of 6 feet, can be whitewashed and cleaned as often as the Medical Officer in charge deems it necessary to call on the barrack master to do so.

9. The main hospital has a privy and urinal, both in one, at either end, 20 yards distant and connected with it by a covered way. In each is a series of copper pans set in stools, and their contents are emptied directly into the filth cart every morning.

The iron-framed hospital has also a privy and urinal at each end, connected with it by a covered way. The construction is the same as the barrack privy. The filth removed is carried 1½ miles distant.

10. There are two lavatories, like those of the barracks, opening out of the north verandah of the main hospital, and sufficient for the sick. The lavatories of the iron-framed hospital

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	are connected by a covered way. The native hospital latterly used by the artillery has no lavatory; the men wash in the verandah, but hereafter they are to be accommodated entirely in the main hospital. 11. There are two rooms out of the verandah of the main hospital for hot, warm, and shower baths. There is the necessary boiler and cistern. 12. The hospital linen is washed at a tank adjoining the hospital and dried in the sun by the washermen, who "do the linen up" at their own houses. 13. The storage is sufficient and dry, or will be so on the completion of certain repairs and improvements now in progress. 14. The hospital cots in use are 3 feet high, 2½ feet wide, and 6⅓ feet long. The framework is of wood, and the bottom either of cane or of crossbands of iron. The bedding, *i.e.*, the mattress, pillows, and bolsters, are of "Kharooa," a coarse kind of red cotton cloth, stuffed with tow. It has been decided to introduce iron bedsteads shortly, with closely cross-hooped buttons; mattress of coir covered with English ticking and tree cotton pillows. When these come into use there will be no just cause of complaint. Each patient has also two sheets and a country blanket, or two if necessary. 15. The kitchen of the main hospital is about 40 yards to the north of the wards. That of the iron-framed hospital is within 20 feet The cooking apparatus is the same as within the barracks. It is sufficient, but the cooks are not highly paid, and of the worst description, therefore requiring constant supervision. When the hospital is not overcrowded considerable variety of fairly cooked diets can be obtained. 16. The diet tables, &c. are those of the Bengal Medical Code. 17. The sick are nursed under a hospital serjeant and native "ward coolies," who fetch water and make themselves generally useful. When sick men cannot quit their beds, one or two comrades are allowed to attend them, and to make the ward coolies do their duty. When the medical officer and his subordinates and the hospital serjeant are vigilant, patients rarely want for proper attendance. 18. I consider the sanitary condition of the hospitals as satisfactory. No epidemic has appeared in the men's ward. Cholera showed itself in the female hospital two years ago, when it was overcrowded. The ventilation at that time was imperfect, but has since been greatly improved. It appeared also that some animal having got under the floor of the hospital through a broken grating, and perished there, was at the time referred to as a probable cause of sickness. 19. I know of no deficiencies or sanitary defects requiring removal which are not in the course of being remedied; many improvements have been carried out during the last two years, through the instrumentality of Medical Officers. 20. There are good dry walks and seats for convalescents for morning and evening use, but there are no trees or shady walks about the hospital. There is a light and easy ambulance waggon, drawn by two bullocks, for giving convalescents an airing 10 at a time. 21. There is a female hospital, where the families of soldiers are attended by their regimental surgeon. There is no matron at present, but two native female attendants. Diets and medicines are prepared and supplied as for the men's hospital. I think every considerable station ought to have a matron for the women's hospital, to act under the surgeon. She ought to be an experienced nurse, and capable of assisting at confinements. 22. There are no local hospital regulations. 23. I believe that in stations the surgeon has practically now-a-days (especially when supported by his Commanding Officer) every necessary power in matters appertaining to the sanitary state of his hospital, repairs of buildings, diets, medical comforts for the sick. He has great power also in camp and on the march, but its degree there must depend on circumstances. 24. A convalescent hospital or wards are not required. In the event of an epidemic, it would be better to send the recovered men away altogether for a time.
XIII. BURIAL OF THE DEAD.	1. The burial ground is about a mile N.E. from the barracks, the prevailing winds being N.W. and S.W. No inconvenience is ever felt from the graveyard. 2. The old burial ground being full, a new one was lately consecrated. Its area is 3 a. 3 r. 30 p. It adjoins the old one. The soil and subsoil are those already described. There is little drainage possible, and there are no funds for laying out or keeping the ground. The new one is, however, to be laid out with care on a plan by the Chaplain. 3. The grave there is 2½ feet by 7, with 2 feet between the graves. Usual depth 4 feet. Never re-opened as a general rule, though it has happened. There is no positive regulation as to times of burial, either at ordinary times or during epidemics. Natives always dispose of their dead a few hours (within 12 hours) after death. 4. Graveyard never known to be offensive, and no precaution required to prevent nuisance. The usual practice is to bring soldiers 6 or 18 hours after death, generally at sunrise or half an hour before sunset. The coffin is conveyed in a cart. 5. The Hindoos throw their dead into the Hoogly. The Mahommedans bury them in two or three burial grounds, near the station. 6. I am not aware that any injurious consequences result from the present practice. 7. I think, as an improvement, that a small sum might be allowed by Government, and placed at the disposal of the Chaplain, for keeping the ground in order. During epidemic time the dead ought to be buried within 12 hours *at most* after death. I have known bodies to be kept too long, and ill effects to follow.

(Signed) J. B. DENNIS, Lieutenant-Colonel Royal Artillery, commanding at Dum Dum.
HUGH M. MACPHERSON, Surgeon Bengal Artillery.
T. M. HEYWOOD, Lieut., Assistant Engineer.

Dum Dum, 30th June 1860.

BERHAMPORE.

Accommodation { European Troops } Infantry, 1 Regiment.
{ Native Troops - } „ 1 „

References to Subjects and Queries.	Replies.
I. Topography.	1. The station is located on alluvial soil, which continues eastward throughout the country; liable to inundation from the Ganges. Westward the same description of soil continues on the right bank of the Bhagirutty river for three miles, till it reaches the raised land or platform, consisting principally of disintegrated earth, abounding in nodular limestone and fusiform iron ore. The country is flat, sandy and swampy. Water in considerable quantity, also much wood and jungle. 2. The station is 76½ feet above the level of the sea. The station is on level ground, about 3 feet below high-water mark in the river. There is higher ground, but of limited extent, three or four miles south-west from Berhampore, on the right bank of the Bhagirutty. It ranges from 50 to 60 feet above the highest flood level in the Bhagirutty river. In a military point of view it has disadvantages, being cut off by the river from the City of Moorshedabad. The valleys during the rains are full of water, which remains till December or January, and the country is considered unhealthy by the natives. 3. The nearest range of hills is the Rajmahal range, about 40 miles distant. Their heights vary from 300 or 400 feet to 800 or 1,000 feet. They are covered with dense jungle. 4. The station is on the left bank of the Bhagirutty, and is surrounded with jheels. The right bank of the Bhagirutty and the land to the north of Berhampore is occasionally liable to overflow from the river during the rainy season. All the jheels overflow during this season, or from the beginning of July to the end of September. There are many holes in and around the cantonments full of water during the rains and cold weather, and half full during the rest of the year of stagnant water and decaying vegetable matter. These holes are of no great size, and are at too great a distance from the barracks to have any injurious effect on the troops. Residents in the immediate vicinity suffer from remittent and intermittent fevers, more than those living at a distance from them. 5. The men's barracks and officers' quarters are in a square, and are as open and exposed to the prevailing winds as two native bazaars, north and south of cantonments, and the square plan of the buildings allow of. The temperature is not perceptibly raised by reflected sun heat, but the circulation of air is impeded by the causes stated in the previous answer. The station is exposed to land winds from the west and north-west from October to March, and from east and south-east from April to September. Squalls, with rain from the north-west, frequently occur in the months of April and May, and their effect is always beneficial. 6. The country surrounding the station is cultivated. There are no works of irrigation near the station. Rice is not cultivated to any extent near the station, although the cultivation is not prohibited. There is no cultivation of indigo or preparation of hemp or flax carried on near enough the station to have any injurious effect. 7. The outskirts of the town of Berhampore are contiguous to the station. 8. The surface consists of a thin crust of vegetable mould over alluvium, sand, and clay. The station is a very old one, and in all probability the ground on which it is formed had not been previously occupied. 9. During the dry season water is found about 30 feet below the surface; during the wet season immediately below the surface. Indeed the level of the station is below high-water mark, and is protected by an embankment raised along the left bank of the river. 10. The rain fall and surface water does not flow readily away. As the water in the river and jheels falls, the rain fall is partly carried into them by surface drains and by percolation, but it is chiefly carried off by evaporation. There is no drainage from any higher ground which passes into the subsoil of the station. 11. Water is derived from the river, wells, and tanks. Drinking water for European troops is chiefly drawn from wells, and that for the natives from a tank close to their lines, which is carefully guarded. With this exception tank water is not generally used for drinking. The tanks are kept as full as possible, but during the hot season they become more than half empty. The usual vegetation in tanks consists of water lilies, water bean, duckweeds, sedges, horse tails, grasses, and reeds. The usual animals are Indian carp, fresh-water shark, cuttle fish, Indian eel, fresh-water mullet, Indian jack fish, Indian frog, musquitoes, infusoria, &c. No tank used for drinking is ever used for bathing. The drinking water for the station is not liable to pollution. At the close of the rains, and during the early part of the cold weather, there is much unpleasant smell from the tanks and jheels, in and around cantonments, from decaying vegetable matter. No arrangement is made for keeping the tanks trimmed and clean, and cleaning out the long grass, reeds, and weeds, growing around their edges, which would prevent the evil. 12. The water supply is almost unlimited. The water from the wells is tolerably pure, and quite free from taste and smell when passed through charcoal, which is supplied in rude but efficient filters to every barrack. When filtered the water is perfectly good. There are no means available for ascertaining its chemical composition. It is raised in leather buckets by manual labour. No better water supply is obtainable. 13. The drainage of the station outside the barrack square is greatly neglected. The ditches dug along the road sides for the purpose are generally most uneven at bottom, and much too deep to be of much use as drains; the consequence is, that the rainfall is not carried off as

BERHAMPORE. BENGAL.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	it might be, but is left to evaporate or pass slowly into the subsoil. As it gradually dries off it leaves rank vegetable matter at the bottom of the ditches, for the sun to act upon. Although the European troops do not suffer from this cause, being located at a distance from it, the native troops do, as do all the residents out of the barrack square. 14. There are no published rules as to the selection of stations. When a new station is to be formed, a committee is nominated to report on the site by the commander-in-chief, under special instructions transmitted from head-quarters.
II. CLIMATE.	1. The meterological instruments at this station consist of a thermometer, F., an aneroid barometer, and a pluviometer. 2. The following table gives the mean of observations for three years, from January 1857 to December 1859:—

Months.	Barometer Mean. in.	Mean Temperature.	Mean Daily Range.	Mean Max.	Mean Min.	Rain, Inches.	Winds. Directions.	Winds. Force.	Remarks.
		°	°	°	°				
January -	29·94	64	25	76	51	0·06	Westerly	Moderate	Heavy dew at night, occasionally dense fog in the morning before 10 a.m.
February -	29·90	68	28	82	54	0·48	Do.	Do.	Do. do.
March - -	29·86	78	30	91	61	0·46	N.W.	Do.	Occasional squalls, generally commencing about sunset, and lasting from one to two hours, with more or less rain.
April - -	29·74	83	29	98	69	1·41	N.W. & N.E.	Do.	Do. do.
May - -	29·62	85	28	99	71	6·11	W., E.	Do.	Do. do. Frequently cloudy during the day.
June - -	29·51	87	23	100	77	6·85	E. & S.E.	Do.	Very hot and oppressive during the first half of the month. Temperature much reduced by the fall of rain during the latter half.
July - -	29·50	84	14	92	76	13·63	S.E.	Do.	Generally cloudy through the month.
August -	29·57	81	13	90	77	9·65	S.E.	Do.	Do. do.
September -	29·67	83	13	91	78	5·96	S.E.	Do.	Do. do.
October -	29·79	79	18	88	70	4·94	N.N.W. & E.	Do.	Cloudy during early part of month.
November -	29·92	70	21	81	60	—	N.W.	Do.	Heavy dew at night, occasionally dense fog in the morning before 10 a.m.
December -	29·95	65	20	75	55	0·20	N. & W.	Do.	

	3. The climate is damp. There are frequent fogs, especially during the cold weather, which however, rarely last longer than from before sunrise until 9 or 10 A.M. The heat is very oppressive during April, May, and the early part of June, but is often reduced for two or three days at a time by squalls from the N.W., which clear the atmosphere and act most beneficially on the health of the residents. The troops stationed at Berhampore during the last two years have not been more unhealthy than at other stations. The present rules as to diet and clothing appear to be well suited to the climate. The men should be restrained as much as possible from unnecessarily exposing themselves between sunrise and sunset from April to October. Duties, drills, and exercises should be limited accordingly. The most healthy months are December to February. The most unhealthy from August to November, when the prevailing diseases are fevers of the remittent and intermittent type, affections of the spleen, diarrhœa, dysentery and affections of the liver, and rheumatic affections. 4. I am unable to say, from personal experience, whether there be any locality more conducive to health in the neighbouring districts. 5. The following is a list of the stations at which I have served:— Cawnpore.—Unhealthy. Etawah.—Comparatively healthy. Banda.—Unhealthy. Mynpoorie.—Healthy. Mussoorie.—Hill sanitarium. Allyghur.—Healthy. Shahjehanpore.—Healthy. Naynee Tal.—Hill sanitarium. Allahabad.—Comparatively healthy. Futtyghur.—Comparatively healthy; might be rendered more so by prohibiting the manufacture of lac dye and saltpetre within the boundaries of or close to cantonments, and the cultivation of melons in the bed of the river near the station, during the dry season. Berhampore.—Has not been unhealthy as compared with other stations in Bengal Proper during the past year; my experience does not extend much further back.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Maps and plans.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	4. The following table gives the accommodation at the station:— Date of construction of barrack unknown, supposed 80 years ago. Total number of barracks—three upper storied and eight lower roomed.

Barrack Rooms.	Regulation Number of Men per Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in feet per Man.	Height of Beds above the Floor.	Doors (no windows).		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
3 Upper Roomed Barracks:		Feet.	Feet.	Feet.	Feet.					Feet.	Feet.
2 rooms each=6 barrack rooms.	52	153	22	16	53,856	1,037	70	1½ to 2 ft.	34	10	5½
4 rooms each=12 rooms.	24	108	18ft. 3in.	16	31,536	1,314	82	1½ to 2 ft.	26	10	5½
4 Lower Roomed Barracks:											
1 room each=4 rooms.	100	300	26½	16	127,200	1,272	79½	1½ to 2 ft.	88	7	4
Guard room	4	10	16	16	4,096	1,024	64	1½ to 2 ft.	—	—	—
Prison cells; 24 in 2 ranges, with corridor between.	1	10	7	18	1,260	1,260	70	—	—	—	—

Four of the 24 men's rooms in each of the upper room barracks are occupied by men, and four are for messing and recreation. Thus there are only 200 men in each of the upper room barracks. All the rooms communicate with the verandahs by open doorways; the Venetian doors being all placed in the outer walls of the verandahs. These verandahs are on both sides; they are 12 feet broad and 16 feet high under the beams. In the lower room barracks there are two enclosed verandahs, 327 feet long, 11 feet broad, and 16 feet high, used for messing and recreation; and there are also two outer verandahs of the same length and breadth. Each centre room for men is divided into fifteen compartments, 8 feet high, with passage 4½ feet wide at each side. There are four lower room barracks of the same dimensions as above, divided into compartments, each 26 feet long by 8½ feet wide, for quarters for 120 married families.

5. As already stated, there are no windows, but Venetian doors opening to the ground on opposite sides of the barrack. The verandahs are never used as sleeping quarters. There are jalousies.
6. The bedsteads consist of iron laced cots on wooden frames, mattresses stuffed with hemp, blankets or coverlets consisting of cotton sewn between layers of chintz, and sheets.
7. Tents are double-poled, each pole 10 feet high, with a ridge pole between them of six feet. The length of each tent is 20 feet, and the breadth 15 feet, with accommodation for 16 men at 129 cubic feet, and 18 feet 9 inches superficial per man.
8. Barracks and guard-rooms are ventilated through the roofs, which are pierced with holes 2½ feet in diameter, and covered with earthen ventilating zumlahs. The ventilation is sufficient to keep the air pure by night and day. Punkahs are supplied to every barrack for cooling the air. They are made of long wooden frames, over which cloth is stretched. To the lower margin of the frame a double frill of cloth, about nine inches deep, is fastened. These frames are from 20 inches to 2 feet deep, and are attached by long ropes to the beams of the roof. They are swung backwards and forwards by a rope attached to one of the sides.
9. The barracks are constructed of brick and mortar, with flat and terraced roofs on saul wood beams. Tents are of canvas. Huts which are only used by native troops and camp-followers consist of mud walls, with thatched or tiled roofs.
10. The floors are terraced and tiled. Those of three upper room barracks are 2½ feet above the level of the ground. Four lower room barracks, and four barracks for married men, have the floors barely 1½ feet above the ground. The floors of these eight barracks have been lately asphalted and much improved. There are no air-flues under them, the plinth being filled in with broken brick and rubbish.
11. Probably no improvement could be suggested in the materials or construction. The repairs are under the barrack department, and are executed by the public works department on requisition. There are three kinds of repairs—annual, petty, and emergent. The commanding and sanitary officers are responsible for the sanitary state of the cantonment. Lime-washing is done annually throughout, or whenever required by the medical officer.
12. Every barrack is supplied with lavatories, both for men and women. The water is supplied from the tanks and wells, carried in goat-skins by men, poured into external cisterns, and conveyed into the rooms by leaden pipes with tap-cocks. The drains from them empty themselves into the surface drains.
13. The cooking is carried on, in the usual fashion of the country, in open fire-places. The water is supplied by water carriers, and the refuse water is carried off in open drains.

    The washing and drying of linen are performed by native washermen at a distance from the station. No convenience for this purpose exists in the barracks.
14. The contents of privies are carried away in cylindrical revolving night carts, and deposited in pits about a mile from cantonments. The urinals are mere wells, and the contents pass into the soil. This latter arrangement is most objectionable, the urinals being frequently full and very offensive. The buildings are ventilated by louvre boards the whole length of the building.
15. The barracks and outbuildings are lighted at night by oil lamps.
16. The following are the arrangements for drainage and sewerage. The barracks are surrounded by open concave drains from two to three feet in breadth, and about six inches in depth,

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References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	These are daily washed and sprinkled with lime. All surface drainage empties itself into a large tank, a quarter of a mile long, and 320 feet broad, immediately in rear of the barracks. The drainage of the barrack square is sufficient for removing surface water. All the lower room barracks are damp, but less so since the floors have been asphalted. The dampness is caused by the level of the floor being 1½ feet lower than the highest flood level of the river. The cesspits to which the contents of the privies are carried are about a mile from the barracks, and about a mile and a quarter from the hospital. They are merely holes of a certain depth, which are filled up when necessary, and others dug instead of them. The cantonments are surrounded with jheels within half a mile, and the bazaars, looking in the stations to the north and south, abound in foul ditches with putrid water. 17. The barrack drains are cleansed by the conservancy establishment of sweepers, under the barrack department, as often as required. Manure is removed in carts, of which only one is permanently allowed, which is quite insufficient for a square mile of cantonment. 18. Cropped grass is the only vegetation within the cantonment, together with a few gardens of residents. No sanitary improvement can be made, as regards external ventilation, so long as bazaars full of jungle holes and huts enclose the cantonments on two sides. 19. Nothing can be worse than the sanitary condition of the bazaars. Conservancy establishments are kept up under the magistrates on a scale far too limited to be of much real benefit. But, were it otherwise, the habits of the natives are such that but little improvement could be hoped for without the most stringent regulations enforced, and carried out by Europeans specially employed for the purpose. The native houses are dirty in the extreme. There are either dung heaps close to them, or deep holes full of stagnant water in their immediate neighbourhood; these are the common cesspit of the house. There is no nuisance from the native dwellings unless the wind blow from the north, when there is frequently a most offensive smell from holes full of dirty water and filth, and also from the elephant and bullock sheds, which are far too near the barracks. The nuisance might be removed by filling up the holes, or at least by trimming their banks, and preventing the natives from resorting to them, also by removing the elephant and bullock sheds to a greater distance. 20. Animals for the use of the soldiers are slaughtered about 300 yards from the station. The slaughtering places are washed with lime morning and evening under the supervision of the commissariat serjeant. No nuisance whatever is experienced in the station from these places. 21, 22. There are no cavalry at the station, and no bazaar horses in cantonments, except a few in the native lines, at the end farthest from the barracks, for Europeans. 23. There is accommodation for 120 married families. No married people occupy quarters with the men.
Officers' Quarters.	1. Officers occupy hired quarters, formerly the property of Government, but sold in 1801. They are low and damp, and much out of repair. The floors, with a few exceptions, are raised only 18 inches above the ground. There are no drains under the floors, and, as a consequence, the damp is continually rising up through them. The only ventilation is by windows and doors. The proprietors should be compelled to keep these quarters in a proper state. They are not susceptible of improvement, unless a second floor could be raised on arches 18 inches or 2 feet above the present floors.
IV. HEALTH OF THE TROOPS.	1. The district and the native population are unhealthy, particularly during the latter part of the rains and the early part of the cold season. 2. The most prevalent diseases among the native population are rheumatic affections, fevers of all types, bowel complaints, diseases of liver, spleen, and lungs, cholera, and small-pox. 3. The causes of this are damp climate, rank vegetation, holes full of stagnant foul water, close to almost every house, forming the usual cesspool of the neighbourhood. Imperfect drainage. The utter neglect of ventilation, and of all sanitary measures generally, and the low level of the surrounding country. 4. The stations at which the troops served before coming here were as follows:— *European Troops.*—Lucknow for 4 months, leaving October 5th, 1859. The men suffered much there from fever, dysentery, and venereal disease. Arrived at the present station healthy on October 22nd, 1859. Since arrival the diseases from which they have chiefly suffered are fevers, rheumatism, diarrhœa, dysentery, hepatic and venereal affections. *Native Troops.*—Last station, Calcutta for 18 months. Left it December 11th, 1859. They suffered in Calcutta from fevers, dysentery, cholera, and venereal affections. They arrived at Berhampore healthy on December 23rd, 1859. Since arrival they have suffered from fevers, dysentery, rheumatism, and venereal diseases. The lower roomed barracks are more unhealthy than the upper roomed barracks, on account of dampness. 5. Troops are not camped out at this station. 6, 7, 8. I cannot speak from experience as to the effect of hill climate on troops. I have held medical charge of two of the sanitaria for civilians, and, judging from observation in them, I should most strongly approve of hill stations for troops if carefully selected. 9, 10. There are no special diseases at these sanitaria, except at Almorah, where every person on arrival is liable to be attacked with diarrhœa, but in a very mild form. It is generally attributed to the drinking water. Boiling the water and filtering it through charcoal when cool is considered a necessary precaution, and a successful one. 11. The best seasons for residence at hill sanitaria are the hot weather and rains. But invalids, for whose diseases the climate is suitable, should always remain during the winter also, if possible. The best period of residence is 18 or 20 months, arriving at the hills in March, and remaining till the following November twelvemonths. 12. There is no period of residence at hill stations which would make troops more susceptible to disease on returning to the plains. 13. The special precautions required on leaving hill stations are attention to clothing, much warmer clothing being required for the hills. Lighter clothing is required when near the foot of the hills; but the chief precaution to be taken is not to allow the men to obtain country spirits, a precaution more necessary than it appears at first sight. 14. I consider that service in the plains, with a change to the hills for a couple of years, after intervals of four or five years, would be equally conducive to the health of a steady man of good constitution, as a longer residence in the hills and shorter service in the plains, if suit-

References to Subjects and Queries.	Replies.
IV. Health of the Troops—*cont.*	able indoor employment and amusement were provided during the hot weather and rains on the plains. Change of station on the plains about every two years would be beneficial. 15, 16. No experience of the accommodation at hill stations. The present hill stations range from 6 to 8,000 feet above the sea. 17. There is no higher ground near the station. 18. The most healthy ground for stations is a surface formed from disintegrated limestone mixed with vegetable mould, and a subsoil of sand mixed with light clay, such as is found in many parts of the north-west provinces. 19. Soldiers proceeding to India should not be under 22 years of age. The best period in which to arrive in India is from November to January. Strict attention should be paid to clothing on arrival; recruits should be prevented from unnecessarily exposing themselves in the sun, and they should be kept out of bazaars. 20. Recruits should be sent direct from home to India, and sent up at once to the north-west provinces and the Punjab. 21. Troops proceed to the interior in well-covered bullock carts, one-third of the men marching by turns, or they are marched up, proceeding some 10 or 12 miles each day, to the next encamping ground, where tents are pitched and arrangements made for their comfort; or they proceed by water in large roomy flats towed by steamers. Every reasonable precaution is taken to prevent exposure by land, or overcrowding in the flats, and to provide for the comfort of the men. 22. As regards the length of service in India, a man of sound constitution, acclimated and of steady habits, might serve as long in India as in any other part of the world out of England, if due precaution against unnecessary exposure be observed. 23. In conducting medical boards, every member is free to express his opinion, which receives due weight. As a general rule there is little room for doubt as to the propriety of seconding the regimental surgeon's recommendation. No improvement can be suggested on this head, except that regimental medical officers should be authorized to apply for a board whenever they deem it necessary to bring a patient before one without reference to season. 24. The best season for invalids leaving India is from December to March.
Diseases.	1. There are health inspections every Saturday. 2. There is no scorbutic disease at the station. 3. The admissions into hospital from hepatic disease amount to 1 in 10·2 of the total admissions. Intemperate habits, exposure to the sun's rays, and malaria, are the chief causes of hepatic disease. It is generally preceded by derangement of the digestive organs, or by intermittent or remittent fever. The most likely measures to diminish the frequency of hepatic disease would be to provide indoor amusement and employment for the men, and so diminish the attraction of the canteen. Coffee and biscuit should be substituted for the morning dram, and the cleanliness of the men and of their quarters most strictly attended to. 4. There have been no cases of dracunculus. 5. Admissions into hospital from venereal diseases are 1 in 6·2 of the total admissions. No precaution for diminishing the frequency of this disease can be suggested, unless that when the men are in hospital from it, they should be subject to the loss of pay and of the time for service, a precaution of very doubtful benefit, as it might lead to long-continued concealment of the disease. Lock hospitals do not appear to be necessary in this country. 6. The troops suffer from epidemic diseases. The subjoined table is made up from very limited data, there being but a wing of Europeans (269 men) and two companies of natives at the station :—

Admissions to Total Admissions.

——	Quotidian Intermittent.	Tertian Intermittent.	Quartan Intermittent.	Remittent Fever.	Common Continued Fever.	Dysentery.	Cholera.	Rheumatism.
Europeans -	1 in 10	None.	None.	1 in 11·2	1 in 8	1 in 37·33	None.	1 in 9·33
Natives - -	1 in 5·13	1 in 20	1 in 120	1 in 6·9	1 in 10	1 in 17·2	1 in 69	1 in 6·5

There have been no deaths from these diseases.

7. The type of disease is endemic, with rapid prostration of strength. These diseases prevail in the latter part of the rainy season and early part of the cold weather. The favouring atmospheric conditions are, a humid state of the atmosphere, the sun at the same time acting on the decaying vegetable matter exposed on the surface of the soil. There cannot be a doubt that the absence of sufficient attention to drainage around cantonments, and the difficulty if not impossibility of enforcing attention to cleanliness and ventilation in the native dwellings of the bazaars, which close in the station on two sides, and the foul holes full of stagnant water in the immediate neighbourhood, tend much to the prevalence of these diseases. From the preceding remarks it will be seen how much of the evil is attributable to the personal habits and conditions of the natives. Intemperate habits among the troops, and neglect of personal cleanliness, would also predispose to these diseases, as would exposure. Rheumatism is in the great majority of cases connected with a syphilitic taint.
8. The duties and occupations of the European soldier in barracks are not of a nature likely to increase the prevalence of epidemic disease.
9. Small doses of quinine have not been tried as a prophylactic at this station.
10. For the mitigation of epidemic disease I would recommend thorough attention to ventilation and cleanliness in barracks, as well as to personal cleanliness, also attention to the drainage and cleanliness of the station generally. The conservancy establishment should be raised to an efficient strength, and placed under a steady European, who should be held responsible for the cleanliness of the barracks and station. No native bazaar, not under military control, should be allowed within a mile of the station,

BERHAMPORE. BENGAL.

References to Subjects and Queries.	REPLIES.
V. INTEMPERANCE.	1. The soldiers at this station are usually temperate, and there are no confirmed drunkards.
	2. The proportion of admissions to hospital for diseases produced by intemperance are as follows:— Diseases directly produced - - - - 1 in 120; „ indirectly produced - - - - 1 „ 10. There are no total abstainers in the wing. 45·5 per cent. of the sickness, and 34·25 per cent. of the crime, occur among temperate men, and among drunkards the proportions are of sickness, 52·5 per cent.; and of crime, 65·74 per cent. Drunkenness *per se* is punished as an offence.
	3. Spirits are sold both at the canteen and at the bazaar. Canteen spirits are good; bazaar spirits are very bad. The average consumption of spirits per man per diem during three months ending March 31st, 1860, were—canteen spirits, 1·66 ounces; bazaar spirit, unknown. Spirit is no part of the ration at any time. Men are not known to take a dram before morning parade. Spirit is never given as a ration to convalescents.
	4. The consumption of spirits is injurious, except to old soldiers who have long indulged in the habit. It is conducive neither to discipline nor efficiency.
	5. It would be beneficial not to allow spirituous liquors as any part of the ration, and to abolish their sale in the bazaar, if such could be done. The sale of spirits might be allowed in the canteen under proper restriction.
	6. Malt liquor is far less injurious than spirits, and in many cases beneficial.
	7. Coffee, tea, lemonade, and other similar drinks are used at the station, and are highly beneficial.
	8, 9. It would be beneficial to substitute beer for spirits, except for those who have long indulged in excess in the use of spirits.
	10. I would recommend that the sale of good spirits be allowed at the canteen under proper restrictions, and to establish well conducted coffee and reading rooms at a distance from the canteen.
	11. There are no bazaar regulations on these points. Spirits are not allowed to be sold there, except with the sanction of the authorities. The canteen regulations are as follows:— 1. A non-commissioned officer will be daily appointed to superintend the canteen. 2. The canteen will be closed at tattoo. 3. No liquor is to be taken out of the canteen except by officers' and the sergeants' mess. 4. No person is to be permitted to remain in the canteen who appears to be under the influence of liquor. 5. No men confined to barracks, or convalescents, are to be allowed in the canteen. 6. No credit, under any pretence, to be given by the canteen man or his servant to any individual in barracks.
VI. DIET.	1. The ration per man per day for Queen's and European troops consist of— Bread - - - - - 1 lb.; Mutton or beef - - - 1 lb.; Rice - - - - - 4 oz.; Sugar - - - - - 2½ oz.; Tea - - - - - ⅝ oz.; Or, coffee - - - - - 1⅘ oz.; Salt - - - - - 1 oz.; Vegetables - - - - 1 lb.; Firewood - - - - - 3 lbs. The meat ration is generally beef. It is changed for mutton twice a week. The tea ration consists of one-third green tea and two-thirds black tea. The vegetables are such as are procurable in the bazaar at the season. The rations are inspected every morning by the officer on duty, and by the quartermaster.
	2. Rations as above are provided. No fruit allowed as a ration. There are no stoppages for rations. The soldier takes three meals a day, viz.:— Breakfast - - - - - at 8 A.M.; Dinner - - - - - „ 1 P.M.; Tea - - - - - „ 6 P.M. The nature of each meal is settled by the majority of the members of each mess. The amount of vegetables in the ration is 1 part to 3½ parts.
	3. The present rations are sufficient for health. It is a military crime to dispose of rations.
	4. Cookhouses are attached to each barrack. Cooking utensils are chiefly made of copper, and tinned once every fortnight. They are always kept clean. Besides these copper boilers there are gridirons, and frying pans, with ladles and choppers, &c. The kitchens are clean, well ventilated, and sufficiently supplied with water. Whether the food is boiled or roasted is decided by the majority of the mess. The cooking is good. Tea, coffee, or other refreshment before a march is only provided by the men themselves.
	5. Soldiers' gardens could be advantageously established at the station, particularly during the cold weather, for then European vegetables and annuals can be raised. The management of the garden should be under an officer of the regiment, and a proportion of non-commissioned officers always present. The men might be allowed and encouraged to work during the greater part of the day in cold weather, and for an hour morning and evening during the rest of the year when off duty. They should be allowed to sell the proceeds on condition that they deposit the profits in the regimental savings bank.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The summer dress consists of cane helmet with cotton cover and a thick roll of cotton cloth around the outside of it over the temples. Loose white cotton tunic. White cotton trousers, socks, and shirt. Flannel under-shirt, ammunition boots. The winter dress consists of

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*cont.*	helmet as in summer during the day. Forage cap at night. Red cloth tunic, blue cloth trousers, woollen socks, white cotton shirt, flannel undershirt, ammunition boots, grey cloth great coat, only worn when necessary. The dress is suitable. The recent improvements in the hot weather clothing leave nothing to suggest in addition to the existing regulations. The men on guard are dressed as above and protected by sentry boxes.
Duties.	1. The men should be thoroughly drilled at home before being sent to India. 2. The usual routine of duties is as follows:—Reveillé at daybreak; second bugle half-an-hour afterwards; parade bugle in another half hour; guard mounting immediately before parade. Breakfast at 7.30 A.M. in hot weather, and 8 A.M. in cold weather. Dinner bugle 1 P.M. Tea 6 P.M. summer and 5.30 P.M. winter. Tattoo 9.30 P.M. in summer and 8.30 P.M. in winter. Drill parades twice a week from 1 to 1½ hours' duration. Bathing parades twice a week. The men do not suffer from parade or drill. There are no general orders respecting these. The best hours for drill and parade are one hour before sunrise in the hot weather, and in the cold weather an hour after sunrise, and an hour before sunset. When marching, the men should reach their ground in the hot weather before 8 A.M. The men have on an average four nights per week in bed. 3. The furthest European guard from barracks is 600 yards. The furthest native guard is about a mile. Guards last 24 hours, from 7 A.M. to 7 A.M. There are roll calls by day only for defaulters, three times daily. There is no bad effect from night guards on the health of the men now at the station. No additional precautions to those taken are requisite. During the rainy season and cold weather the sentry should always have his great coat within reach.
III. Instruction and Recreation.	1. There are five ball courts and two skittle grounds at the station. There are no schools. There is a library and reading room, but neither are lighted at night. There are no day-rooms, soldiers' gardens, workshops nor gymnasia. A theatre is being fitted up. The means of recreation are not sufficient. During the hot weather and rains the men are not allowed out of barracks between 8 A.M. and 5½ P.M. The restriction is beneficial to health. No restriction during the cold weather. 2. The establishment of reading rooms, workshops, theatres, and soldiers' gardens would greatly increase the existing means of recreation, and be very advantageous in every respect. 3. Savings banks have now long been introduced generally in European regiments. They are advantageous. 4. There is not sufficient shade to enable the men to take exercise without injury to health during the day.
IX. Military Prisons.	1. A new and commodious military prison, with every precaution for preventing injury to the health of the prisoners, has been constructed during the past year.
X. Field Service.	1. There are no regulations as to field service not included in the general Presidency regulations. 2. Medical officers are not consulted in general in the field, except in selecting the ground on which to pitch the hospital tents. 3. There are no sanitary regulations to which reference can be made at this station. Camping grounds are selected with as much care as circumstances allow of, particularly with reference to high and clean ground, and a supply of good water. Medical officers are not consulted, except in the choice of a site for the hospital tents. 4. There is no copy at the station of any regulations bearing on the subject of field hospitals.
XI. Statistics of Sickness and Mortality.	1. No returns.
XII. Hospitals.	1, 2. The hospital is situated about 250 yards N.W. of the barracks, about 180 yards S.W. of the bazaar, and about 250 yards from the nearest officers' and civilians' quarters. The upper story is open and exposed to the prevailing winds. The circulation of air round the lower story is much impeded by a high brick wall with earthen bastions at the corner, which completely surrounds the hospital. The site is objectionable; close to the bank of the Bhagirutty, which for six months in the year is a nearly dry sand-bed, exposed to the sun's rays. The hospital site is perhaps rather lower than that of the barracks. The drainage is very imperfect. The surrounding ground is uneven, but there are no marshes, nullahs, or water pits in the immediate vicinity. The bank of the river in the dry season is perhaps the greatest nuisance, as it is almost impossible to prevent natives resorting thither after dark. 3. Water is derived from two wells within the hospital enclosure, but the water from them, as elsewhere, requires to be filtered for use. Water for the purpose of ablution is obtained from the river. 4. The only means of drainage consists of one small drain for carrying off refuse water, &c., which communicates with a cesspool immediately outside the wall of the enclosure, about 30 yards from the hospital building. 5. The floors are raised two feet above the ground. There is no perflation of air underneath the floors. The roof water is all carried off by the surface drains. It does not sink into the subsoil. There are three principal surface drains made of brick and terraced over, extending the whole length of the hospital enclosure, parallel with the hospital. Into these all the lesser surface drains open. At one extremity they communicate with the open drains of the station, and at the other with the river. There is not sufficient fall to carry the rain-water rapidly off. The hospital is built of brick and mortar, walls 2 feet 6 inches thick; roof flat, terraced, 1 foot thick. The hospital is generally cool. There are enclosed verandahs on both sides, 15 feet 9 inches thick. There are no open verandahs. Sufficient shelter from the sun's rays is not afforded. The verandahs are not used for accommodation of sick or others.

BERHAMPORE, BENGAL.

References to Subjects and Queries.	Replies.

The hospital is two floors in height. Date of construction unknown. Seven wards; 156 beds.
The following table gives the accommodation:—

Wards.	Regulation Number of Sick per Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area per Bed.	Height of Bed above the Floor.	Doors or Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.			Feet.	Feet.	Feet.	Feet.	Feet.
No. 1 - -	20	60	21½	19½	25,155	1257·75	64½	2	10	10	4
„ 2 - -	28	84	21½	19½	35,217	1257·75	64½	2	14	10	4
„ 3 - -	20	60	21½	19½	25,155	1257·75	64½	2	10	10	4
„ 4 - -	20	60	22	19½	25,740	1287	66	2	10	10	4
„ 5 - -	28	84	22	19½	36,036	1287	66	2	14	10	4
„ 6 - -	20	60	22	19½	25,740	1287	66	2	10	10	4
„ 7 - -	20	60	22	19½	25,740	1287	66	2	8	10	4

XII. Hospitals—*cont.*

There are no windows on the lower story. There are Venetian doors. The upper story is provided with glazed doors as well as Venetian doors. The glazed doors are in two leaves, which fold back from the centre inwards. The arrangement is conducive to ventilation and coolness. The Venetian doors open outwards in their upper two-thirds. The lower third is fixed.

6, 7. Ventilation is provided for by openings above each door, 3 feet high and 2 feet wide. Punkahs are pulled night and day during the hot weather in each ward. The upper story wards are at all times free from odour and closeness. The ventilating openings are about 2 feet above the doors, and are fitted with jalousies. No means of cooling the air except punkahs.

8. No means of warming required.
The walls and ceilings of wards are cleansed and limewashed twice a year.

9. The two principal privies are placed 36 yards behind the hospital, to the north of it, and there is a covered archway leading to each. The privies are supplied with copper pans, having metal covers. The pans are 2 feet deep. The urinals are cylinders of plate iron, 3 feet deep and 18 inches in circumference. There is a separate privy for the natives, not much used. The drainage is very imperfect. There is a cesspool attached to the privy for natives, but not to either of the others. The pans being kept clean they are not offensive.

10. The lavatories are provided with baked earthen basins, which appear to be sufficient.

11. The bathing house, provided with hot and cold baths for the sick, is out of repair. The men are now provided with wooden tubs, 3 feet in diameter and 2 feet deep. The arrangement is a very inconvenient one for the sick.

12. The hospital linen is washed by washermen, at a distance from the hospital.

13. The hospital storage is sufficient and dry.

14. The bed cots are wooden frames with laced iron bottoms. The bedding consists of a mattress, large and small pillows, stuffed with country hemp, two sheets, one country blanket, and one ditto lined with chintz.

15. There are two hospital kitchens, placed about 40 yards behind and north of the hospital. The fire places are the same as those used by the natives for cooking. The cooking utensils are of copper, tinned once every fortnight. The arrangements appear to be sufficient, and the diets can be varied as may be necessary.

16. Diet tables and rolls are the same as in other European hospitals.

17. As regards attendance on the sick, one hospital serjeant is allowed, and orderlies, chosen from the men in barracks, are obtained when necessary, on application of the medical officer. There are no regular nurses or orderlies. Trained orderlies would be greatly preferable to the present arrangement.

18. With reference to the general sanitary state of the hospital, it has not been necessary to place any sick on the ground floor of the hospital since the arrival of the troops now here. The state of the upper floor appears to be satisfactory. No epidemic disease, hospital gangrene, or pyæmia have appeared among the sick.

19. As to general defects, the drainage of the hospital compound and surrounding ground is very defective. The bath room is of no use in its present state, but if repaired might be made serviceable in treatment.

20. Patients are allowed to walk in the compound and on the flat roof of the hospital, morning and evening. There is no shade from the sun's rays, no walks or seats set apart for the use of convalescents.

21. A ward is set apart for soldiers' wives and children, who are on a similar footing as regards medicines and comforts as the soldier; but one anna a day only is deducted for stoppages. The arrangements are satisfactory.

22. There are no local hospital regulations.

23. Repairs in the hospital buildings are executed on the requisition of the medical officer countersigned by the commanding officer of the station. Hospital diets and all changes in them are arranged by the medical officer only. Medical comforts are supplied to any extent required, the only check being that the approval and counter signature of the Deputy Inspector General are required every month.

24. There are no convalescent wards; the broad enclosed verandahs render such wards unnecessary when the number of troops is so limited.

XIII. Burial of the Dead.

1. The European burial ground is about a third of a mile from the barrack square, in an E.S.E. direction; the prevailing winds being S.E. and N.W. There is a separate burial ground for officers and non-military residents.

2. The burial ground is 600 feet long by 421½ feet broad. Soil and subsoil as already described. Drainage none. The ground is a perfect swamp in the rains. It is kept as carefully as this circumstance admits of. It is surrounded by a wall 4 feet high.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	3. There is no limit as to size of grave spaces. The depth is 5 feet, and graves are not reopened. There is no limitation as to times of interment after death, either at ordinary times or during epidemics. The bodies of Hindoos are burnt and thrown into the river. The bodies of Mohammedans are buried in their own burial ground, at a distance and beyond the limits of military authority. 4. The European burial ground is offensive occasionally from decaying vegetable matter rather than from other causes. Attention to drainage and preventing the growth of long grass would prevent all nuisance. Burial generally takes place 12 hours after death. In all cases the time is left to the military surgeon. 5. The dead of the camp followers are disposed of in the same way as the dead of native troops. 6. The river is frequently most offensive from the remains of half burnt or unburnt bodies floating down. The birds of prey prevent the nuisance being of long duration. 7. Complete incremation should be enforced before a body is thrown into the river. It would be a blessing to the country if throwing bodies into the river could be entirely prohibited.

Thos. Ross, Lieut.-Col., Commanding the Station.
Fred. P. Lavard, Captain, Executive Engineer, Bengal District.
J. A. Guise, Surgeon Major, Bengal Medical Establishment.

10th June 1860.

DINAPORE.

Accommodation
- Queen's Troops
  - Artillery — 1 company with battery, and 1 reserve company; but not completed.
  - Infantry — Old Barracks—6 companies. New Barracks—A full regiment.
- Native Troops
  - Cavalry — Lines for 1 Cavalry regiment to be erected.
  - Infantry — Ditto. ditto.—1 regiment.

Reference to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is a dead level, little above high flood mark. It is flat, and much covered with water in rains. It is dry in the cold weather, and during the hot the soil cracks. The Ganges runs along the north face of the cantonment. A nullah passes along the south side on the western portion, and afterwards passes through the centre towards the Ganges; during the rains the nullah is flooded. There is much wet land, more or less flooded, to the south and west: on the south side of the cantonment is a filthy hollow, and behind it a deep and offensive hole. 2. The elevation of the above the level of the sea is 212 feet, and above that of the adjacent country a few feet only. The Ganges is the nearest river. A nullah runs through the station, and there is a swamp near the magazine, on the south side of the cantonment. I do not consider there is any higher or healthier ground adjoining the station. 3. The nearest table-land I believe to be at Burhee, on the Grand Trunk road, distant about 120 miles. The elevation of Burhee is about 1,500 feet above the level of the sea, and about 1,290 feet above the station. 4. With regard to the nearest water from the station, the Ganges forms the boundary on the north; the nullah runs through, and there is a marsh within the boundaries on the south side. N.B.—Both nullah and marsh dry up in the cold weather. The vicinity of the station is liable to overflow. In wet seasons the station may be said to be under water all but the strip on the river bank. In ordinary years the west parade ground is half flooded after every rise of the river. There is much broken ground along the banks of the nullah, where earth has been dug for bricks and other purposes; but the worst is the hole near the magazine, and the hollow in Moorgeeah chuck, behind. They undoubtedly tend to increase fever and dysentery in the drying up season, September and October. 5. The station is tolerably open, and nearly a dead level. There are not many walls of any height. The officers' bungalows on the river's bank are rather crowded, and the trees scarcely trimmed enough. The bungalows to the west of Racket Court are still more crowded. The worst are the bazaars which crowd upon the east, south, and south-west of the station, and in which there is no proper ventilation. The temperature of the station is not raised by being exposed to reflected sun heat; the nights are fairly cool on the whole. The prevailing winds are the east before and during the rains (April to September), and the west for the rest of the year. The setting in of the west wind is generally attended with increase of sickness, this being the time of desiccation; and in November and December bronchitis, fever or dysentery are produced from the cold, which is sharp, especially at nights. 6. The surrounding country is highly cultivated. There are no works of irrigation, properly so called; but every hollow which holds water is used as a tank from which to water the neighbouring fields. I am not aware that artificial irrigation, as practised here, has been

DINAPORE. BENGAL.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	found to have any effect on the health of the station. Rice cultivation is not prohibited. The ground being for great part under water, it is probably better that rice (the only suitable crop) should be cultivated. Indigo is not cultivated near the station. Hemp is prepared within a mile or so, but in small quantities, and not so as to cause a nuisance in the cantonment, or to be injurious to health. 7. The bazaar in 1807 was estimated to contain 16,000 inhabitants, and now probably numbers many more. The city of Patna commences at Bauhipore, 7 miles distant, and runs for 10 miles to the east. 8. The geological structure of the district is alluvial, light, sandy soil, and low down in the river bed a few patches of kunkur exist, but in very small quantities. I believe that the station was new ground when selected. 9. Water is found during the dry season at 30 feet below the surface, and at the depth of 6 feet during the rainy season. 10. When the station is not flooded from the Ganges, the rain-fall, if light, runs off at once, if heavy, it takes some hours to do so; but is eventually chiefly run off by the nullah into the Ganges. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply is obtained from wells, and also from the Ganges. There are no tanks. The well water is little liable to pollution from leaves; but the wells of the barracks were some years ago poisoned by infiltration from privies, which were too close. 12. Any amount of water can be supplied for the use of the station. It is clear and sparkling, without smell. That of the river is tasteless; but some of the wells are a little brackish. Tested by Dr. Dunbar, Her Majesty's 5th E. I. Regiment, the water of the wells shows sulphate of lime, oxalate of lime, carbonate of lime, and some chlorides, and in one well with a slight excess of vegetable matter and a little ammonia. The water is generally raised in leathern or iron buckets, and distributed by bheesties in leathern bags. The river-water after filtration is the best, especially during the dry season. 13. The overcrowding, bad drainage, and filth of the bazaars must add greatly to the unhealthiness of the station. Some of the streets were last year impassable dunghills until drained and cleared by order of the Brigadier; and all the south of the station, the elephant sheds, and Moorgeeah chuck, are in a state disgraceful to any cantonment. The meat market also was in a very bad state during the rains. 14. I am not aware what are the regulations in force respecting the selection of a new station; they appear to vary. There ought to be a special committee, consisting of two or three senior medical men, two or three commanding officers of regiments, the chief civil authority, and the executive engineer. The ground should be examined, the population, especially children, looked to, and, if possible, a trial made on a small scale, by putting a detachment there, before permanently selecting a new station.
II. CLIMATE.	1. The only meteorological instruments at this station are one or two thermometers or rain guages with the European troops. 2. No data. 3. The climate is generally a medium one, between the damp of Bengal and the drought of the north-west. It is tolerably dry in the cold weather, yet not so much as to wither up the grass. It is damp, of course, in the rains, but neither is the heat (April, May, and June), nor cold (in November, December, and January), so great as in the north-west. It is tolerably free from dust, and moderately variable only. There is fog occasionally in November and December, generally going off in the forenoon. Bronchitis and bowel complaints are produced by the cold nights in cold weather, and the same with dysentery, and perhaps cholera, from sudden chills, from storms, during the rains. Warm clothing is required during the cold weather, and flannel should be worn at all seasons. The diet should be nutritious; but the animal food should be reduced during the hot weather and rains. Drills and exercises may be carried on all day, or at any time in December, January, and February. For the rest of the year, they should be diminished, and in the hottest part not more than one hour in the mornings should be devoted to them. The men should not be unnecessarily exposed to the sun. During the cloudy weather of the rains the men may be out more if the opportunity is watched; but in September and October great care is necessary. In average years the most healthy months are December, January, February, and March. The most unhealthy are June, August, September, and October. The prevailing diseases during the latter are heat apoplexy, fevers, dysentery, and bowel complaints, and hepatic diseases. 4. I cannot say there is any district near the station the climate of which is more conducive to health than that of the station. Arrah did not prove healthy lately when occupied by Europeans. Burhee is 120 miles distant, and therefore can scarcely be called near. 5. The following are the stations at which I have served, with the comparative salubrity of each:— 1. Hazareebaugh is very healthy, and perhaps best of all suited for European troops. 2. Dinapore is sufficiently healthy for officers. The men used to suffer fearfully from dysentery, and a good deal of cholera, but less latterly. 3. Agra is in general years favourable, but is subject to frequent and severe outbreaks of cholera. 4. Bareilly is a very pleasant and favourable station, yet with a considerable tendency to fever. 5. Barrackpore; I served with natives. It is not considered favourable to Europeans. 6. Kyooh-Phyoo. I was there for three months. The natives suffered a good deal; but not an officer was on the list the whole time. 7. Rangoon. I served there during the second war. It is not nearly so unhealthy as was expected, the troops averaging only about 10 per cent. on the list after they were housed. Fever and dysentery were the prevailing diseases. 8. Delhi. The old cantonment is very unhealthy from fever and dysentery. The city is in ordinary years favourable, cholera being rare. 9. Umballa is a very favourable station.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Application for a map of the station must be made to the Surveyor-General. Plans of the station and barracks are transmitted.

4. TABLE OF BARRACK ACCOMMODATION.

The date of the construction of the permanent barracks is unknown; that of the temporary barracks is 1858–9.

Barrack Rooms or Huts.	Regulation Number of Men in each Room.	Dimensions of Rooms, or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in feet.				*Number.*	*Height.*	*Width.*
		Ft.	Ft.	Ft.	Ft.					Ft.	Ft.
East Infantry Barrack -	308	827	35	17	492,064	1,597	94	2	156	11½	5½
West ditto -	308	826½	35	18	520,537	1,690	94	2	156	11½	5½
Artillery ditto -	92	265½	35½	17	159,086	1,729	102	2	50	11½	5½
No. 1 Temporary Barrack of 6 rooms.	16	48	20	17	16,320	1,020	60	2	48	9	4½
„ 2 ditto ditto	16	48	20	17	16,320	1,020	60	2	48	9	4½
„ 3 ditto ditto	16	48	20	17	16,320	1,020	60	2	48	9	4½
„ 4 ditto ditto	16	48	20	17	16,320	1,020	60	2	68	9	4½
„ 5 ditto ditto	16	48	20	17	16,320	1,020	60	2	48	9	4½
„ 6 ditto ditto	16	48	20	17	16,320	1,020	60	2	48	9	4½
„ 7 ditto ditto	16	48	20	17	16,320	1,020	60	2	48	9	4½
„ 8 ditto ditto	16	48	20	17	16,320	1,020	60	2	48	9	4½
„ 9 ditto ditto	16	48	20	17	16,320	1,020	60	2	48	9	4½
„ 10 ditto ditto	16	48	20	17	16,320	1,020	60	2	48	9	4½
No. 1 ditto Artillery of ditto.	16	48	20	17	16,320	1,020	60	2	48	9	4½
„ 2 ditto Married Men ditto.	5	60	20	17	20,400	4,080	240	2	60	9	4½
„ 2 ditto ditto	5	60	20	17	20,400	4,080	240	2	60	9	4½
„ 3 ditto ditto	5	60	20	17	20,400	4,080	240	2	60	9	4½
„ 4 ditto ditto	5	60	20	17	20,400	4,080	240	2	60	9	4½
No. 1 ditto Artillery Married Men's Barrack and Canteen of 3 rooms.	4	48	20	17	16,320	1,020	60	2	24	9	4½
Permanent } Guard-room	—	148	20	15	44,400	—	—	—	28	11	4½
Temporary } Guard-room	—	137	20	17	46,580	—	—	—	21	9	4½
Main Guard, 11 Cells. } Prison Cells.	1	15	9	17	2,295	2,295	135	2	1	7	4
Solitary „ 15 Cells. } Prison Cells.	1	8	6	12	576	576	48	2	1	8	3½
Temporary Main Guard 4 ditto. } Prison Cells.	1	12	8	14	1,344	1,344	96	2	2	7	3½

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Stations—*cont.*	5. There are doors and doorways in the barrack rooms on opposite sides, and facing each other; they are double flapped, and open on hinges. There are no windows. In the permanent barrack there are pillars and verandah on the south side, 10 feet wide, and in the temporary barracks pillars and verandah on the north-east and south sides, 10 feet wide. These are never occupied as sleeping quarters for the soldiers. In the permanent barracks there are jalousies and jhilmils, but in the temporary barracks there are none. The doors are all battened. 6. The bedsteads used in the barracks are wooden framed cots with rattan bottoms, and some few are wholly of iron. 7. The tents used are double poled, with double fly and single kanats covered with three fold cloth, 21 by 15. There are 16 men to each tent, and the space allotted to each man nearly 138 cubic or 20 superficial feet. 8. The means of ventilation in the barracks and guard-rooms are by doors and skylights (which latter however do not open), and in the tents by doors, by air entering beneath the kanats, or by tricing up the latter. These means are sufficient for ventilation during the day, when many of the doors are open, but not so during the night with closed doors. Tatties, or porous screens, upon which water is thrown, are allowed in the barracks for cooling the air, which passing through them absorbs the moisture and is cooled. Punkahs also are allowed, which act by moving the air over the men and thus causing it to absorb the perspiration and cool the body. The tatties I consider are apt to cause chills and bring on rheumatism or ague. 9. The materials used in the construction of the permanent barracks are brick and lime mortar masonry, with flat terrace roof, and in the temporary barracks brick and lime mortar masonry for foundation plinth. 10. The permanent barracks are terraced 1½ feet above the ground and solid beneath. The temporary barrack floors are tiled, raised 2 feet above the ground but are solid beneath. 11. The materials are generally suitable. The flooring however of the temporary barracks is bad, being constructed of half-burnt brick; it should have been of chunar stone. The chief permanent barrack is bad, for it runs east and west, which is the prevailing direction of the wind and therefore it is badly ventilated. The cross has always been more healthy than the others. The barracks and cantonments are kept in repair by the Executive Engineer; repairs are quickly executed. The walls and ceilings are cleansed and limewashed annually by regulation, but it can be done under the authority of the Commanding Officer when required as a sanitary precaution. Hospitals are whitewashed quarterly to a height of 6 feet, and twice, completely, in the year. 12. The water for the men's wash-houses is supplied by bheesties from the wells; they are drained into the nullah on the south side by masonry drains. Two double wash-houses and one plunge bath are attached to each wing of the barracks. In the temporary barracks

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	there are no plunge baths, but there is one wash-house to each barrack, supplied by bheesties with water from the river. They are drained into cesspool wells. 13. The cookhouses of the permanent barracks are supplied by bheesties with water from the wells, and are drained into the nullah on the south side by masonry drains. In the temporary barracks water for the cookhouses is supplied from the river by bheesties; they are drained into cesspools. Linen is washed in India by dhobies or native washermen, who take it to the river side, wash, dry, and return it. 14. There are no urinals at present to the permanent barracks, but the building is drained into the nullah, the filth being removed daily in carts and thrown into the river. The privies of the temporary barracks are drained into deep pools; the filth is removed daily in carts and thrown into the river. 15. In the permanent barracks the buildings are ventilated by means of tin ventilators in the roof, and by wooden barred windows to the south, with some open brickwork in the walls. The temporary barracks are ventilated by ventilators along the ridge of the roof, and by wooden barred windows. The barracks are lighted at night by oil lamps. 16. The drainage of the permanent barracks is effected by open saucer-shaped drains, along the north and south sides, 3 feet wide, turning off south to the nullah, distant 160 yards. The ground is sloped off round each of the temporary barracks towards an earthen drain to the south, whence it crosses the road by a brick culvert east of the public gardens, and thence to a nullah distant 780 yards from married barracks. The drainage is sufficient. The buildings all become more or less damp in the wet season, the temporary barracks more so than the permanent. The worst, if not the only foul ditch, is behind to the west of the garden range leading to the nullah. This is often very offensive. I have heard that a new pucca drain has been sanctioned. 17. The surface cleansing within the cantonment is generally fair. The sweepings were, if not still, thrown on a bank to the south side of the nullah, and part to the south-west of the magazine, performed daily by filth carts. 18. The parade grounds are covered with grass, which is eaten off by cattle. There is a good deal of vegetation in some of the gardens, and it is excessive in the neighbourhood of the orderly bazaar. Trees and bamboo clumps in some parts are too thick, and not trimmed up enough. The walls are generally low; one, however, round the permanent hospital, has been recommended to be lowered. There are few, if any, hedges. 19. The drainage of the bazaar is very deficient, there being no regular system; and the drains are in many places choked up, in others forming deep holes of festering mud. The ventilation is very bad. The water-supply from wells and rivers is sufficient. Cleanliness is only external; there are no latrines, and the population is as thick as it can be. The bazaar inhabitants are compelled to keep the space in front of their houses swept every morning before breakfast, and the sweepings are afterwards carted to a distance. The bazaar serjeant goes round daily to see that this is done, and reports by memorandum made on the spot any person near or on whose premises he finds nuisances, such as accumulations of filth, cesspools, stagnant water, &c. These parties are then punished by fine. Until lately there was but one filth cart; there are now three, with a sweeper and driver to each. These are paid for by the inhabitants, upon whom a tax is levied to cover this and a night watch. No Government conservancy establishment is now allowed; a gang of convicts formerly was. What is most required is a conservancy police, with the establishment of public necessaries. The native houses are crowded together. Cesspits, I believe, do not exist; but there are many holes caused by excavations of mud to make walls. These are gradually filled up with straw, sweepings, &c., which, of course, ferment when wet with rain. I have heard that dead bodies are sometimes buried in some of the huts near Dugah. I am not aware that any nuisance is experienced in barracks from wind blowing over the native houses. 20. A slaughter-house was formerly situated in the heart of the bazaar, but is now in the open fields to the south-east of the cantonments, and beyond the boundary pillars. This, however, would change if another contractor were appointed, as it is private property. There should be a Government slaughter-house. The offal is sold to or removed by people of dome caste (very low), who use it. At present there is no nuisance from the slaughtering place, it being well removed, but it should not be allowed to be re-established within the cantonment. There is a nuisance from the cattle being kept on the premises of the contractor in the bazaar. Sheep thus kept are particularly offensive; but even large cattle, in the number and manner they are kept, are objectionable. 21. There are no regulations for stabling the bazaar horses. They are put up within and without the cantonments, according to the owners' pleasure. Much of their dung is made into cakes, dried, and burnt, the refuse being carried off by filth carts. 22. The artillery stables consist of three sheds on wooden posts, with tiled roofs, each shed containing two rows of horses. The sheds are situated south-west of barracks, distant about 150 yards, and about the same distance to the south of the hospital. There are no dung-heaps, the whole of the sweepings of the stable being used for the riding school. There are no picketing grounds. 23. There are sufficient quarters for the married men; none occupy barrack rooms with the single men.
Officers' Quarters.	1. The drainage, &c., and the ventilation are the same as the barracks, only quarters have glass doors. Officers also live in bungalows by the river's bank, and others on the south side of the station. The accommodation being scanty, interlopers should be turned out, at least to a moderate extent.
IV. HEALTH OF THE TROOPS.	1. The station and district are generally healthy, especially to natives. 2. The prevailing diseases are fevers, including small-pox, cholera, and bowel complaints, also a peculiar kind of palsy affecting the lower limbs: at first causing a peculiar strut, afterwards a drag of the foot, the toe being turned inwards and drawn along the ground. There is some tremor with this, but not much; the upper extremities are free. Spleen disease is not common. 3. The unhealthiness of the native population is caused by too much or too little rain, bad drainage, and the holes near all the native houses. Some of the native towns, Arrah and Gyah for example, are disgracefully filthy. 4. The last station which the 4th company 5th Battalion Artillery occupied was Thyat Myo, Burmah, where they remained from August 1855 till May 1857. Their health was pretty

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	good; but they suffered from fevers, syphilis, diarrhœa, dysentery, and a few hepatic cases. They arrived at this station June 17, 1857, in good health, and have since suffered from fever, dysentery, and syphilitic affections. Her Majesty's 5th E.I. Regiment left Berhampore on the 20th November 1859, after a residence of 12 months. Their health there was good, the men suffering chiefly from diarrhœa, dysentery, and fever; they were very free from syphilis. Their state of health on arrival was generally good; the prevailing diseases since being syphilis, gonorrhœa, hepatitis, dysentery, and diarrhœa. Her Majesty's 73rd were at Lucknow from the 19th July to 1st November 1859. Their health on leaving was good, but the regiment had suffered from fever, diarrhœa, dysentery, and syphilis. They arrived on the 15th November 1859 in good health, 39 sick; they have since suffered from fevers, diarrhœa, dysentery, and venereal affections. In the permanent barracks, the south side is less healthy than the east, probably because the latter is best ventilated, owing to the prevailing direction of the wind. The temporary barracks became very unhealthy at the beginning of the cold weather, partly from the constitution of the year, partly, perhaps, from defect of light in them, and from the exhalation from a mud bank in the river. The Mynpooree levy suffered greatly; but they occupied some miserable huts, the remains of a bazaar. 5. The troops at the station are not camped out; it would however be useful. The 19th were recommended to be sent into camp, and marched up the Grand Trunk road to Benares with much benefit. 6. I have never been in charge of troops in a hill station. 7. My experience does not enable me to speak as to the men, but officers assuredly, if their cases have been properly selected and managed, are less liable to fever and other diseases on returning from the hills to the plains, owing to improvement in the general health and tone of the system. 8. As far as my experience enables me to speak, I approve of hill stations for troops; but there is too often a want of room for exercise, and sometimes difficulty in feeding the men properly. I believe this has been greatly overcome now. Hazareebaugh I consider a climate almost equal to the hills for health, having abundant food, room for exercise, &c. Of course it is hotter than the hills, but it is considerably cooler than ordinary plain stations. 9. Hill diarrhœa attacks in some stations men, officers, ladies, and children. It is more prevalent at the sanitaria in the neighbourhood of Simla; but not met with, I believe, at Darjeeling. 10. Clothing, diet, shelter, and proper exercise must be attended to, and, of course, are useful to preserve the health of the troops; but as many officers, ladies, and children suffer who are well off in all the above respects, it is evident that all these precautions will not completely guard the soldiers. 11. The hot and cold seasons are the best for residence in hill stations; but the rainy season must also be spent there, not as being good, but as better than the plains. Patients often gain nothing until the dry weather sets in. One year is generally sufficient for a residence in a hill station in order to produce a beneficial effect on the health of troops. 12. I know of no period of residence in a hill station which would be likely to inflict injury on troops returning to the plains. Many officers retain the most perfect health in the hills for many years; a few, generally men much exposed, such as medical officers, break down and are compelled to go home on sick leave. 13. Troops when about to descend to the plains should only be sent down at the beginning of the cold weather, and the rations might perhaps be somewhat reduced on coming to the plains, yet officers come down at all seasons, make no change in their manner of living, and keep their health. 14. With respect to troops serving in India being located in hill stations, with short periods of service on the plains, this depends entirely on the locality. There are some stations in the plains in which the men would remain nearly as healthy as in the hills; there are others which never can be anything but extremely injurious. In these latter, the shorter the time in the plain, and the longer in the hills, the better. In the healthy localities an occasional short tour in the hills would be sufficient. Change is very beneficial from an unhealthy to a healthy station. I have seen the reverse very injurious. 15. The only sanitarium with which I am acquainted is Jullah Pahai (Darjeeling); there the barrack and hospital accommodation is very defective. The rooms are very dark, not sufficiently ventilated, independently of doors and windows; the wash-houses are cold, no hot water-supply; the cook-rooms small and dark, and the privies and drains defective and ill arranged. 16. I have not had sufficient experience to show what ranges of elevation above the sea form the best sites for hill stations. 17. I have before pointed out Burhee as a station which could be very advantageously occupied. It is 120 miles distant, and accessible by a decent road in the dry weather, which is much cut up in the rains, its elevation about 1,500 feet. The climate is generally like that of Upper India, but modified by locality and elevation, the nights being cooler and the days not so trying as in the north-west, while there is little of the great damp and treacherous sun of Bengal. 18. A sandy soil and subsoil is generally, *cæteris paribus*, the most healthy. 19. If soldiers proceeding to India are not to be exposed or put on duty at once, they may be sent out from 16 to 20, but if required for service or exposure, from 20 to 25, at least. The constitution of the lads breaks down. The best months for troops to land in India are November and December undoubtedly. Never having been stationed in Calcutta, I cannot say how troops are disposed of on first landing. Recruits should land at the commencement of the cold weather, should not be allowed to remain a day in Calcutta, but be at once despatched to a healthy locality under charge of officers—regimental and medical—well acquainted with the country. 20. No experience to enable me to judge whether troops should be sent to intermediate stations before being landed in India. For the soldier landing in India, if not too young, a residence for a few years in a climate like Burhee or Hazareebaugh would be sufficient, but if young, with unformed constitutions, residence in a hill climate would be very advantageous. 21. The mode of transport to the interior should be conducted by officers, who have had the charge of men "en route." I may only say there is the route by steamers on the Ganges, and by land on the Grand Trunk Road; either making the ordinary marches of 12 miles daily, or being conveyed by carts, with relays of bullocks, 30 or 35 miles daily.

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	22. The number of years a British soldier should serve in India should not be more than 10, without a break, but by sending him occasionally to a hill station, this might be extended. 23. The manner of conducting medical boards is not such, as altogether to avoid conflict of opinion as regards invaliding. Men passed by the station committees are sometimes sent back by the presidency ones; yet I think there should be a subsequent examination of invalids before embarking. I have known them to be so much improved by the voyage down, that further change was unnecessary. 24. Troops should be sent home from India, if viâ the Cape, from 1st February to 15th March; if by overland route, from 1st April to 15th May.
Diseases.	1. There are regular inspection parades held weekly at this station, for the discovery of incipient diseases. 2. There has been no case of scorbutus at this station at present. H.M.'s 19th, however, last cold weather, were in very indifferent health, and there was in some of the men a tendency to scorbutus. It is, perhaps, to be attributed partly to prevailing fevers during October and November, and partly to darkness of the barracks. For H.M.'s 19th, lime juice was served out twice a week, and they were sent under canvass. I have recommended more glass in the doors of the temporary barracks and hospital. 3. The total number of cases of hepatic disease treated during 1858–9 was 210, with 21 deaths, giving a ratio of 6·5 per cent. on the general admissions, and of 24·1 per cent. upon deaths, abscess having been very common. The disease, in a good measure, was owing to the exposure of the troops in the district, though there has always been a tendency to abscess here in severe dysentery cases, often not discovered till after death; it is not the consequence of any other disease. The very full diet of the men during the hot season is probably partly a cause of frequent hepatic disease, fatty liver, or a tendency to it, being common. Reducing the amount of this, and also its stimulating nature, would be useful. 4. Dracunculus is not found at Dinapore. 5. Venereal complaints have increased much of late years. The proportion at present among the European troops is 62 in 116, or about 53 per cent. It would be advantageous to the health of the army to establish a lock hospital. Is it possible to increase the facilities for marriage? this would be greatly preferable. Among the Native troops, syphilitic diseases are at present only 8 in 56, or at the rate of 14 per cent., and this is higher than formerly used to be the case; the Sikhs being much worse in this respect than Hindostanees. 6. The diseases from which the troops at this station suffer are as follows:— *Fever.*—Remittent fever prevails more or less towards the end of the rains, and beginning of the cold weather. At other seasons, quotidian and tertian are the common forms. *Dysentery* is prevalent and severe. *Cholera* presents itself at this station almost every year in variable severity. *Small-pox.*—There are occasionally a few cases. It occurs generally in March, April, and May, and ceases when the rains begin. *Rheumatism* is not so prevalent here as at many stations. Taking the medical year 1858–59 as a sample, the proportion which admissions and deaths from these diseases bear to the total admissions and deaths is as follows:—

Total admissions	3,186
Total deaths	87

Admissions from		Per-centage.	Deaths.	Per-centage.
Fevers	622	19·5	7	8·0
Dysentery	420	12·1	36	41·4
Cholera	24	0·75	9	10·3
Small-pox	3	0·09	2	2·3
Rheumatism	100	3·1	0	0·0

	7. With regard to the nosological character of the more frequent diseases, abscess of the liver used frequently to be found in dysenteric cases, and often, though not suspected before death, very extensive ulceration of the colon. I think these characters are less marked now than 20 years ago. In April, May, and June, or during the rains, small-pox and cholera are prevalent; cholera is sporadic at other times. Fever is prevalent chiefly at the end of the rains and beginning of the cold weather. The climatic and atmospheric conditions, which precede or accompany small-pox are variable; the drying up of the country with hot days and cold nights accompany fever. The west end of the south barrack is said to be most liable to cholera at the season when this prevails, it being to leeward, and, consequently, by far the worst ventilated. In the bazaars there is neither drainage, water-supply, as such, or ventilation, and they are greatly crowded. The predisposing causes to these diseases among the troops are probably sleeping with open doors, standing before a tatty, or in a draught, when greatly overheated, and perhaps too full a dietary for the season. Among Natives the predisposing causes are overcrowding, bad drainage, and want of ventilation. 8. Epidemic disease at this station is little, if at all, influenced by the nature of the soldier's duties, occupations, or habits. 9. Small doses of quinine have not been tried at this station as a prophylactic against malarial diseases. 10. To prevent or mitigate epidemic disease at the station, clearing away the bazaars, draining them properly, filling up the holes, and using all means to prevent the flooding of the station, would all be of great service in effecting this object.
V. INTEMPERANCE.	1. The soldiers at the station are temperate. The per-centage of confirmed drunkards in the 4/5 Artillery is 2½ per cent.; in H.M.'s 5th E. I. regiment, 2 per cent.; and in H.M.'s 73rd regiment, about 1 per cent. 2. The proportion of admissions into hospital from diseases caused by intemperance, are,—

	4/5 Artillery.	H.M.'s 5th E. I. Regiment.	H.M. 73rd Regiment.
Directly	4	9	6
Indirectly	0	7	1

There are no means of ascertaining the effect of total abstinence, temperance, and drunkenness, on the amount of sickness, mortality, and crime at the station. It depends on the character of the man, whether drunkenness is ever punished as an offence.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	3. Distilled spirits are sold in the canteen, but not in the bazaar. The rum supplied to Her Majesty's 73rd and Her Majesty's 5th E. I. regiment is good in quality. The former consume about 1 dram each man per diem, and the latter about 1½ dram. Spirit is no part of the soldier's ration at the station, on the march, or in the field, but is supplied on payment. The allowance to Her Majesty's 73rd is 2 drams; but none is served out till 1.30 p.m. To the 5th E. I. regiment the allowance is 2 drams; none, however, is served out till the evening. Spirit is not given as a ration to convalescents. Ginger beer, if ill made, is certainly injurious, and its sale is often stopped when cholera threatens. 4. The consumption of spirits is probably beneficial in old soldiers, but not to the young ones, or those unaccustomed to it. With regard to its effect on efficiency and discipline, as it is at present regulated, it has not much influence either way. 5. It would be beneficial to abolish spirits as a ration, and to restrict the sale in canteens. They should not be allowed in any other place. 6. Malt liquor is much preferable to spirits. 7. Tea, coffee, ginger beer, and ginger tea are chiefly used by the men at the station. They have little if any influence on health, efficiency, or discipline. 8. It would be better to suppress the spirit ration, and substitute beer, tea, or coffee. 9. It would be beneficial to prohibit the sale of spirituous liquors in the canteen, and to permit only beer, coffee, tea, lemonade, &c., to be sold to the troops. 10. Coffee-rooms ought to be established in barracks, where the men could be supplied with coffee, tea, lemonade, &c., also with newspapers and periodicals. 11. No spirits whatever are permitted to be sold in the bazaar. The shopkeepers can sell 10 bottles on a wholesale, or 1 bottle on a retail licence, but none under any circumstances to soldiers, non-commissioned officers, or camp followers, except in last case to servants on account of their masters. The rules for Her Majesty's 5th E. I. regiment are those laid down in the Military Code, sec. x., p. 47, with this addition, that each company furnishes an orderly, with an abstract of the men's names, who remains whilst the liquor is served out, and checks over issue to any. The canteen is open from 12 to 1 for the issue of beer only, and from tea to tattoo for spirits. The canteens of Her Majesty's 75th regiment are open in the hot season, from 1st April to 1st November, from gun-fire until 10 a.m., and from 5 p.m. to watch setting, and during the cold season, or from 1st November to 1st April, from gun-fire till 12 o'clock. Whenever practicable, and in accordance with the wishes of the men, the allowance of malt liquor may be issued for consumption with the dinner. No country-made spirits except that furnished by the commissariat is to be allowed in the canteens. No person who may appear intoxicated, or who is under punishment, is allowed to enter the canteen. An orderly serjeant is in constant attendance at the canteen to preserve order and report irregularities. No spirituous liquor, &c., is sold or issued to any native whatsoever, nor can any article be taken from the canteen by a soldier, except by an order signed by the Commanding Officer. No spirits are issued on any occasion before the usual dinner hour, nor is any man allowed more than two drams per man, and these are never issued at the same time.
VI. Diet.	1. The ration for Queen's British troops and European troops in the Indian army is the same, and consists of bread 1 lb., meat 1 lb. (mutton twice a week, beef five times), 4 oz. rice, 2½ oz. sugar, ½ oz. tea, 1¾ oz. coffee, 1 oz. salt, 1 lb. vegetables, and 3 lbs. firewood. There is no periodical change except as vegetables come in or go out of season. The ration is regularly inspected by the officer of the day and the quartermaster. If objected to it is then submitted to the surgeon. 2. A complete ration, including vegetables, is provided for the troops, the stoppage for which is 3 annas 4 pie. Her Majesty's 73rd have three meals a day, viz., breakfast at 7.30, consisting of tea or coffee, and butter, or milk, &c., provided by the soldier; dinner at 1 o'clock, consisting of soup, meat, vegetables, and bread; tea at 5.30, composed of tea and bread. The nature of the meals is the same in Her Majesty's 5th E. I. regiment, and the hours of meals are respectively 8 a.m., 1 p.m., and 4.30 p.m. The proportion of vegetables in a ration is 1 lb. 3. I consider the vegetables supplied to Her Majesty's 73rd inferior, and attribute this to the allowance for them being too small (one pice daily). Those supplied to Her Majesty's 5th E. I. regiment are considered fair in quality. At times, from the season, there is a difficulty in getting a good supply. A cup of tea or coffee should form part of the ration to be supplied on rising in the morning. The supply of tea, if husbanded, is large enough to allow of this, but the coffee would require to be increased. Some men would prefer ginger tea. There is no arrangement for preventing the men of Her Majesty's 73rd regiment disposing of their rations; but in Her Majesty's 5th E. I. regiment the mess orderly (one of the men) remains in the cook-room until all the meat is in process of cooking. 4. The means and apparatus available for cooking are large pots, spits, frying pans, &c. native fashion. A very few and simple means are all that are required. The kitchens cannot be kept clean from the nature of their construction, but are blackened with smoke. They are well supplied with water by bheesties. The food is boiled or roasted as the men please. The cooking is sufficiently varied. Tea and coffee are properly prepared. The men of Her Majesty's 73rd regiment have not been supplied with refreshment before a march, as when moving about the country was in a disturbed state. On the only short march which Her Majesty's 5th E. I. regiment has made, they had refreshment by saving from the rations. 5. The supply of vegetables is good at the station. The soldiers will not work in a garden unless it be close to the barracks, and where they can go out in undress.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress in the cold weather consists of tunic, cloth trowsers, boots, and helmet with cover, in the summer khakee tunic and trowsers. The accoutrements are shoulder pouch, belt and pouch over left shoulder, with 40-rounds, waist belt with pouch and 20-rounds, and bayonet attached. A cap-pouch is attached to the cross belt. Upon the whole, the present dress is suitable to the climate, and for the soldiers' day and night duties at different seasons; but the coverings to the wicker helmets are too thin; a regular turban on a wicker frame would be a much greater protection against sunstroke. The guard dress is the ordinary dress with black trousers at night, and a great coat when it is cold or wet. There is a guard room and sentry boxes.
Duties.	1. It would be advantageous to have the men thoroughly drilled at home, before proceeding

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References to Subjects and Queries.	REPLIES.
VII. Dress, Accoutrements, and Duties—*cont.*	to India, but if possible they must be protected from syphilis, from which they are apt to suffer in large camps. 2. The routine of the duties of Her Majesty's 73rd, is morning parade and drill for one hour at daybreak, and in Her Majesty's 5th E. I. regiment, morning parade one hour five times a week, evening do. twice a week for half an hour—four times for one hour. The men do not suffer from ordinary guards. The best hours for drill, parades, and marches in hot weather, is the early morning, and to 9 or 10 in the cold season. With regard to the average number of nights the men are in bed, those of Her Majesty's 73rd are out once in eight days. The men do not suffer from night guards. The men of Her Majesty's 5th E. I. regiment have always three nights in bed, and sometimes four. 3. One guard of the 73rd regiment is mounted at the magazine half a mile distant from the barracks. The others are mounted in the square. The magazine guard of the 5th E. I. regiment is mounted at a mile and a half distant, the others are mounted in the lines. Guards last 24 hours. There are roll calls at breakfast, dinner, supper, and tattoo and afternoon parade in the 73rd regiment, and in the 5th E. I. regiment at breakfast, dinner, and supper, but if no afternoon parade there is roll call at 5 p.m.
VIII. INSTRUCTION AND RECREATION.	1. The means of instruction and recreation are as follow:—There is a fives court and two skittle grounds for the permanent, and two for the temporary barracks. Also a school with serjeant acting as schoolmaster for the 73rd regiment, and a library and reading-room, both well lighted. The 5th have a school and normal master, also a library which is not lighted at night, but they have no reading-room. The day-room and soldiers' club of Her Majesty's 73rd regiment, are the library and reading room; the 5th have none. There is a soldiers' garden but it is not used by them. There are no workshops for the 73rd regiment; but the 5th have workshops for tailors, shoemakers, and armourer serjeants. There is a station theatre which is hired, it being private property. There are no gymnasia. The means are not at all sufficient to keep the men occupied during the wet season and heat of the day. The men of the 73rd regiment are not allowed out of the barracks from 8 a.m. to 5. 30 p.m. in hot weather. The 5th are kept to barracks from 8 a.m. to 5 p.m. during the hot weather. The confinement is beneficial to health. 2. To improve the existing means of recreation and employment, a large covered space like a railway station, to contain workshops, skittle grounds, ball alleys, quoit grounds, &c., &c. should be erected. A farmyard might be part of the station with advantage, both for the supply of milk, &c. and the amusement of the men. 3. The institution of soldiers' savings banks would be advantageous. 4. There is no shade but that obtained from verandahs, which may be used to enable the men to take exercise during the day.
IX. MILITARY PRISONS.	1. The cells of the temporary barracks are the only ones fit for use; they are well ventilated and lighted. Those of the main guard although large enough are ill ventilated and lighted, and the station cells although better ventilated and lighted are greatly too small.
X. FIELD SERVICE.	1. There are no local regulations for field medical service, not included in the General Presidency Regulations. 2. As regards the conduct of the line of march, the powers of the medical officer depend partly on the commanding officer and partly on the tact of such medical officer; some are ready to take advice, but others despise it, especially if it come from a young man. 3. When not on service in India the camping grounds are marked out, the water-supply arranged for, and nothing remains to be done. On service there are many points to be considered at the same time with medical ones, and it would be an extreme case which would call for the remonstrance of a medical officer. I say remonstrance, because however bad the locality might be, he has no power to cause the camp to move. 4. The hospital tents are carried on elephants; the stores on camels in large trunks carefully arranged, so that everything is at hand; two trunks with a small board between them make a good operating table. The sick and wounded are carried in doolies, which is the best conveyance in the world for a wounded man; the slighter cases on carts or camels. The hospital supplies are furnished by the commissariat on indent as required. A medical depôt is formed generally near the seat of war. I am not aware of any regulations on the subject other than those published in the Medical Code.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.
XII. HOSPITALS.	1, 2. Plans of the hospital are transmitted. The permanent hospital is situated on the river bank about one-third of a mile from nearest barracks, to the west and N.N.W., and far removed from the stables. The barracks and some private bungalows and the barrack master's yard lie between it and the bazaar. The site is not well ventilated. There are cook-houses and privies to the north, a high wall to the south and west, and the same with trees to the east. The site is as healthy a one as can be obtained, the drainage is fair, and the river bank is not injurious. There are no holes or pits. The temporary hospital is at one end of the barrack ranges. The artillery stables are about one-eighth of a mile to S.S.E.; the building is on the river bank. There is an old bazaar, now being pulled down, to the westward, but there are no houses near. The site is open and well ventilated, but to some extent interfered with by the cookhouses and privies, which are not judiciously placed. It is situated in a very fair locality, with good drainage, and without pits or holes near. More sand is in the river bed this year than usual, but this may be carried away next rains. 3. The water-supply of both hospitals is obtained from wells and the river, and is abundant. 4. The refuse water and impurities from the permanent hospital are carried away by pucca drains into the river close by; that from the temporary hospital is drained into cesspools by the out-offices. 5. The height of the wards of the permanent hospital is 1½ feet above the ground; there is no perflation of air beneath. Those of the temporary hospital are 2 feet above the ground; there is no perflation of air beneath. The hospitals are both drained into the river, but much of the roof water of the latter building still sinks into the soil. The ground round the hospitals is sloped, and small drains, or rather slopes, in the hollows carry off the rainfall very fairly. The permanent hospital is built of brick and lime mortar masonry; the walls and roof are simple, but sufficiently thick; it has verandahs, which afford sufficient shelter

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	from the sun's rays. The construction of the temporary barracks is the same as that of the permanent barracks, the walls are single, and the roof of tiles and thatch. There is a verandah on the north side 10 feet wide, which affords sufficient shelter from the sun's rays. The verandahs are used for the accommodation of the sick in case of the centre ward being full, but not otherwise. The hospitals consist of ground floors only.

Table of Hospital Accommodation.

Date of construction of the permanent male hospital, 1821; permanent female hospital, 1851; temporary male and female hospital, in 1859.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patients' Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft.		Ft.	Ft.
Permanent Male Hospital	150	633	21	18	239,274	1,595	88	2	116	9	6½
Ditto Female ditto	16	42	20	20	16,800	1,050	52	2	16	9	6½
Temporary Male Hospital	128	492½	20	17	167,450	1,308	77	2	82	9	4½
Ditto Female ditto	32	151	20	17	51,680	—	—	2	28	9	4½
In the following lines are given the correct cubic and other contents of the temporary Male and Female Hospitals as occupied by the Sick. The measurements above include the whole length of the Hospital Buildings.											
	128	390	20	17	132,600	1,036	61				
	—	96	20	17	34,340	1,079	63				

The permanent hospital stands E. and W., and this being the prevailing direction of the wind, it is not properly blown through. The temporary hospital is better, being nearly across the direction of the prevailing winds. All the windows are doors, and open to the ground, and they are well suited for ventilation. Closing them is a great means of coolness during the very hot weather.

6. The permanent hospitals are ventilated by doors and skylights, and the means are sufficient except when all the doors are closed in the cold weather. In the temporary hospital ventilation is effected by doors, openings in the walls, and by roof openings. I believe that even at night this hospital is free of odour. In the permanent hospital the doors are double, glass in the interior, and venetians externally, which can be set open by a centre bar, so as to admit air and light, or else closed. The temporary hospital doors are wooden, with a few panes of glass over the top.
7. Tatties as described for the barracks are used for cooling the wards.
8. There are no means of warming them. The walls and ceilings of the wards are cleansed and limewashed twice a year, and every other three months to a height of 6 feet, but it can be done under the authority of the commanding officer when required as a sanitary measure.
9. The privies of the permanent hospital are on the north, by the river side. The privy of the male ward of the temporary hospital is on the north and that of the female ward on the south-west side. They are not placed over cesspits, but are drained out to the river bank. The water is supplied by hand. They are offensive, in spite of the use of lime and charcoal, the ventilation being insufficient; this has been represented, and will be improved. (It has since been done.)
10. The lavatory arrangements for the sick are sufficient.
11. There are shower and slipper baths for the use of the sick, and earthen dishes for the feet; also a lavatory with basins for men able to use it. The footwash and bath water is kept in reservoirs supplied by bheesties, and turned on with a cock. The means are sufficient for the purposes.
12. The linen is washed and dried by dhobies on the river bank. The means for this purpose are sufficient.
13. The storage is ample. It is dry in the dry season, but damp, as all places are at the station, during the rains.
14. The bedsteads used in the hospitals are of iron, or wooden frames with iron straps. The bedding consists of one mattress, one large and two small pillows, all of country hemp, two sheets, one or two country blankets, one covered with dimity, bolster slip, and two pillow cases, and a small bedside carpet. The mattress and pillows should be of hair, and it would be an improvement to have English blankets.
15. The kitchen of the permanent hospital is a building to the north, with doors and windows to the south, and a blank wall to the north. There are small fireplaces on the ground, and these with pots, pans, fry pans, and spits enable an Indian cook to prepare anything. The kitchen of the temporary hospital is a building to the east of part of the hospital on the same plan as above.
16. The diet table, &c., are according to regulations of the medical code.
17. In reference to the sick, hospital serjeants merely watch over the discipline of the hospital; there are no nurses. 20 ward coolies and one superintendent are allowed for a regiment to attend on the sick, and these are generally very kind and attentive. There are also sweepers for removing filth and water carriers; besides this in severe cases a comrade or two are told off as orderlies. This attendance is enough in ordinary cases, but there is sometimes a difficulty when the men understand no Hindostanee, although coolies of any standing pick up a good deal of English.
18. The sanitary condition of both hospitals is generally good; there has not, in my time at least, been any hospital gangrene or pyæmia, and although cholera and fever have appeared at times, they have not done so more than in the station generally.
19. I have already stated that the ventilation of the permanent hospital is not all that coul be wished; there are too many buildings and heavy passages about it. The temporary hospital is much too dark, and there are not enough means for shutting out the wind in the

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References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	cold weather. The first defect is in progress of remedy and the second has been partly cured by screens. 20. In the permanent hospital the roof forms a nice airy walk for convalescents, and there is a covered seat by the river side. In the temporary barracks there is a large space fenced in and a river frontage, but in neither are there any walks or shade. Convalescents are often sent out on elephants morning and evening to take the air, and the weaker men in doolies. 21. Female wards are provided for soldiers' sick wives and children, separate from but near the male wards. They are provided with female attendants. The present arrangements are satisfactory. 22. There are no special local hospital regulations. 23. The medical officer is expected to see that the establishments properly perform their duty, that drains are cleaned, water supplied, and the regular hospital routine carried out. In small repairs up to 50 rupees a requisition on the Executive Engineer will obtain what is required for the building; more extensive changes must be reported on by a committee, when, if within 100 rupees and urgently required, they can be ordered by the officer commanding the station; if beyond the latter sum, they must go up for sanction to the higher authorities. As to diet and medical comforts, he can by means of the separate statement make any change or alteration deemed necessary. A medical officer's power is the same in any locality, in so far as what is required is obtainable. 24. There are no convalescent wards or hospital. Men discharged, and not in full strength, are often ordered to appear at hospital night and morning, for a certain time; this excuses them from drills, &c., and gives them a walk. Convalescent wards are not, I think, required.
XIII. BURIAL OF THE DEAD.	1. The British burial ground is immediately on the south side of the nullah, quite out of the line of the prevailing winds. 2. The area of the ground is 4a. 3r. 7p.; the soil is light, and decomposition appears to go on rapidly. Too much grass is allowed in the wet season, at which time the subsoil becomes infiltrated with water. 3. The graves are eight feet long and three feet broad, with an interval of one and a half feet between each; they are five feet in depth. Graves are, as a rule, never reopened; but in one case, some time since, a little boy was buried on his father's coffin. There are no regulations as to interment at ordinary times, or during epidemics. The Hindoos burn their dead on the river bank, and if this be completely done, nothing remains but a few charred bones; but the odour of combustion is disagreeable, and although the burning ghat is out of the station, it should be removed further off. There is now no Mahommedan burial ground within the station; such are apt to be very offensive. The graves being shallow, they fall in at once, and an offensive effluvium comes forth. One, a mile out of the cantonment to the east, has been closed lately. 4. The graveyard is never offensive. Rapid decomposition calls for rapid burial. As a rule, a corpse is only kept long enough for the coffin to be made, and is buried within 24 hours at furthest. 5. The dead of camp followers or bazaar people, if Hindoos, are burned; if Mahommedans, buried. 6. The Mahommedan burial grounds should be placed under surveillance, as they are apt to be very offensive. The burning ghat of the Hindoos also should be watched, as the poorer people sometimes only singe the body, and throw it into the river. 7. Graves ought to be marked with a number, so as to be capable of identification; a tile, stamped with a number, set in the ground, would be sufficient. Improvements with regard to burial of Hindoos and Mahommedans have already been adverted to. The present division marks of the burial grounds are indistinct, and it is suggested that a pucca walk, which runs through part of the ground, might be slightly moved and completed, so as to make a permanent boundary.

(Signed) G. H. SMITH, Colonel,
Commanding at Dinapore.
JOHN BALFOUR,
Officiating Deputy Inspector General of Hospitals.
H. ANDREW, Executive Engineer.

Date, 2nd August 1860.

HAZAREEBAUGH.

Accommodation:—European Troops — Infantry — 960 single men.
Ditto — 120 married men.

References to Subjects and Queries.	Replies.
I. TOPOGRAPHY.	1. The country round the station is open undulating table land. The station itself is dry and the soil porous, not retaining moisture. There are five or six small hills in the vicinity, that is, at a distance of from two to four miles, which appear volcanic. The jungle from N.E. to S. approaches to within four or five miles of cantonments, and is chiefly bushy, with here and there larger trees. There is not much water, except what is artificially collected in tanks by damming up ravines for the purpose of rice irrigation. 2. According to recent surveys the elevation above the sea is about 1,900 feet. A late barometrical observation of the revenue surveyor gives the height at about 1,800 feet. Being elevated table land the station may be said not to be above the level of the adjacent country. There is a gradual ascent up to the station on the N. side of 200 feet, approaching it from Burhee. Burhee itself, on the Grand Trunk road, is about 700 feet lower level. It is 23 miles distant from Hazareebagh.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	3. There are no large rivers, lakes, or canals in the neighbourhood. There is a nullah to the N., about a mile from the cautonment boundary, and separated from the cantonment by a ridge. There is also another nullah to the E. and S.E., by means of which chiefly the cantonment is drained. A committee examined and reported favourably on a site for a cantonment about 2½ miles to the E. of the present station, and from 25 to 30 feet high in level. This was not in consequence of any unhealthiness in the present site, but because it was contemplated to make Hazareebagh a larger station, and the present cantonment was not calculated to accommodate more troops than one regiment. The site chosen would have given more room, was open, and presented natural qualities of drainage, but had the disadvantage of approaching nearer the jungle. There is another good site to the N., about two miles or less from the present cantonment. 3. With the exception of the little detached hills from 300 to 600 feet high already spoken of, there are no considerable mountains or higher table lands in the vicinity. 4. Rice marshes approach the cantonment boundary to the N. and W. The nearest river of any magnitude is the Damoodah, about 30 miles to the S. There are no lakes or canals. The two nullahs have already been mentioned. The vicinity is not liable to the overflow of water, with the exception of the rice lands already spoken of, which are artificially prepared for the retention of water. The surrounding country is intersected with ravines, and here and there artificial tanks, but they do not appear to affect the health of the troops injuriously. 5. The station generally is open and freely exposed to winds. The aloe grows very luxuriantly, and forms the chief hedges of the station. Some of these hedges, which appeared to obstruct the ventilation, have been already removed, and lately it has been proposed as a sanitary measure to level another long aloe hedge which approaches the barracks to the N. side. Also to keep down the height of all hedges to 3 feet above the road level, and to clear away where practicable the lower branches of all trees (not fruit trees) in cantonment to a height of 18 feet from the ground. There is no higher ground, nor house, nor walls likely to interfere with free ventilation. From the barracks being pretty close together it is to be expected that the reflection from the white walls, and radiation of heat at night, must add somewhat to the temperature, but there are no surrounding hills, nor rocks, nor buildings, other than regimental buildings, calculated to produce this effect. The station is not exposed to cold and variable winds, but any long-continued drought is usually followed by storms of rain or hail, particularly in the latter end of March and in April, at once reducing the temperature by many degrees. No prejudicial effect has been observed in consequence on the health of the troops. 6. As already mentioned, there is cultivation of rice to the N. and W. of cantonments, and other patches here and there, where the ground is favourable, but there is not much other cultivation. There are no works of irrigation, except the damming of nullahs and ravines in a few places in the outskirts of cantonments, which have been mentioned above. The artificial irrigation of the rice lands must, it is presumed, to a certain extent affect the sanitary condition of the station, but as Hazareebagh has only been recently occupied by European troops, there are not sufficient data before the committee to enable them to form an opinion on the point. Rice cultivation is not prohibited, except, of course, within the cantonment boundary. It was proposed at one time to forbid the cultivation within half a mile of cantonments, but the proposition was negatived, chiefly, the committee believe, on account of the great expense the measure would entail. In 1858, when the European cavalry depôt was stationed at Hazareebagh, the rice cultivation came close up to the barracks on the E. side, but on the recommendation of the medical officer all that land was taken into cantonments on the fixing of the boundaries the following year. Since then it has been thrown out of cultivation and drained. There is no cultivation of indigo, hemp, or flax near the station. 7. There is no large city or town, except the town of Hazareebagh itself, containing a population, according to native estimate, of from 5,000 to 6,000. The cantonment boundary passes through the town. 8. The surface soil on the rice lands contains clay loam, but in other places, which may be regarded as the natural soil, it is sandy and gravelly. The gravel is quartzose and granitic. Deeper down, about 3 or 4 feet from the surface, you come to tenacious clays, and beneath these, at a depth of from 20 to 25 feet, is found loose black earth in which the water of wells is struck. As far as the committee are aware, the site of the present cantonment has never been occupied by population. Hazareebagh was a station for European troops up to the year 1843, when it was abandoned for military and political (not sanitary) reasons, and it has been reoccupied since the hot weather of 1858 only. 9. During the dry season, water is found at the depth of from 25 to 30 feet. During the rainy season, the wells fill up to within 10 or 12 feet of the surface. 10. The rainfall flows away very readily, as is proved by the fact that after a long continuous rain, a few hours of sunshine suffice to remove all traces, except the dampness of the surface. The natural fall of the ground prevents the rain from sinking deep down, and what does not at once flow away on the surface, drains off through the porous surface soil, and between this and the clay subsoil. During the rainy season, the water of two springs oozes out at the lower end of two of the barracks, considerably below the plinth. Nowhere does the water lie on the surface until evaporated, except where artificial means are employed to retain it. There is no adjacent higher ground, the drainage of which passes into the subsoil of the station. The drainage is all carried off by the nullahs. 11. The water supply is derived from wells and tanks. It is stored in open tanks; there is only one used in the station for drinking water. The area is about 300,000 superficial feet. There are two outside the cantonments, one near the jail, with an area of about 160,000 superficial feet, and one on the Burhee road, about 15,000 superficial feet. The tanks get full in the rains, and the supply gradually diminishes until the end of the hot season, when some of the tanks become almost, if not altogether, dry. Two of these tanks, one in the limits of cantonments, and the other a bunded ravine, never become dry. Another large artificial tank, about half a mile from cantonment, on the Burhee road, always contains an ample supply. The nature of the plants and animals they contain is not known. They are tolerably free from weeds and vegetation. All contain small fish. One of the tanks in cantonment appears to be used both for drinking and bathing, but most of the water for

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References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	drinking purposes is taken from wells. The water is not liable to pollution to any extent. Surface impurities must, of course, pass into the tanks, but no drainage known to be foul is allowed to do so. There is a very offensive tank in the station bazaar (not in cantonments), which must be injurious to the townspeople living in its neighbourhood. There is also a pucka tank near the cantonment post office, which becomes offensive in the hot weather. It ought to be cleaned out thoroughly every year at that season. 12. The supply of water is abundant, but in some of the wells it has a slightly saline taste. There are, however, several good wells in the station, from which persons, particular about the quality of their drinking water, obtain their supply. In these wells it is clear, and free from all colour and unpleasant smell. All water at Hazareebagh used for drinking purposes should be filtered when practicable. The available means for making chemical analyses are very imperfect. Three samples of water have been tested, two of them being well water procured from the two best wells, and one tank water from the only large tank in cantonments, the one already mentioned as supplying water both for drinking and bathing purposes. Both samples, of well water were clear and agreeable to the taste, giving no deposit after 24 hours standing, and slightly acid to test paper. The alkaline bases they contained were lime and potash. One contained a slight trace of magnesia, and the other a slight trace of iron. There were no means of testing for soda. Acid bases were silicic, phosphoric, hydrochloric a trace, and carbonic, also free carbonic acid. Very slight trace of organic matter. Degree of hardness by Professor Clarke's soap test, 4·5. Both these samples were wholesome. Sample No. 3.—Tank water, of a pale brown colour depositing copiously on standing. Alkaline to test paper. Organic matter in considerable quantity. No means of ascertaining its microscopic characters. I consider it unwholesome without very careful filtering. Amount both of well and tank water abundant except in very dry seasons. The usual means of drawing water is by bullocks and chursas, but more frequently by a long pole used as a lever and an iron bucket. The committee do not consider any change called for except the filtering already recommended. 13. The previous queries appear to include every topographical point bearing on the health of the station. A small tank to the north-west of No. 4 barrack, very conveniently situated for supply water in case of fire, should be kept at as low a level in the rainy season as the drainage will admit of. This will be provided for at once. 14. New stations are selected by a committee of the chief civil officers of the district or division. Two military and two medical officers, one subordinate civil officer, and the executive engineer of the division in attendance. Any member of the above committee differing on any point or points can specially record his own opinion. The sites chosen are generally the most elevated and open spots in the locality, inquiry having been made respecting the health of the population round about. The position is generally settled by the Supreme Government. The committee settle the site.
II. CLIMATE.	1. The means and instruments available at the station for conducting meteorological observations are very imperfect. In the regimental hospital there is but one thermometer, and no other instruments whatever for registering meteorological observations. The annexed table is prepared from observations kept by the civil assistant surgeon, but his instruments also are imperfect, and as the observations extend over only two years they cannot be considered of any great statistical value. 2. The following is a table of observations:—

Years of Observation.

From 1st April 1858 to 31st March 1860.

Months.	Barometer Mean.	Mean Dry Bulb.	Mean Wet Bulb.	Rain, inches.	Winds. Direction.	Remarks as to Clouds, Dew, Winds, Storms, &c.
	In.	°	°			
January - -	27·867	67·5	56·8	0·0	N. 7; S. 1; E. 3; W. 20	
February - -	27·819	70·5	60·9	1·25	E. 4; W. 16; S. 8	Hail on 6th February 1858. Tremendous hail storm, 12 Mar. 1859.
March - -	27·757	72·5	61·9	1·95	E. 3; W. 19; S. 9	
April - -	27·795	80·	67·8	·65	W. 16; N. 6; S. 8	
May - - -	27·639	80·65	75·5	4·1	W. 29; E. 2.	
June - - -	27·586	85·7	73·95	12·1	E. 11; W. 12; S. 7	
July - - -	27·569	87·3	76·4	15·45	E. 14; W. 13; N. 4	
August - -	27·581	80·3	76·2	16·6	E. 12; W. 9; N. 10	
September - -	27·660	79·65	74·9	12·45	E. 9; W. 7; N. 2; S. 12	
October - -	27·778	74·65	66·5	6·45	E. 3; W. 21; N. 7	
November - -	27·878	69·2	58·15	0·0	E. 6; W. 23; N. 1	
December - -	27·798	64·85	58·9	1·55	E. 9; W. 21; N. 1	

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. As I have been at Hazareebagh only since July 1858, any opinion of mine derived from personal observation cannot be so valuable as that of an older resident. It appears to me that the climate occupies a medium position between those of Bengal and those of the Upper Provinces. It is markedly drier than Bengal Proper, while the quantity of grass in the place, which at no time gets thoroughly burnt up, proves that it is damper than Upper India. This abundance of grass keeps the air free from dust and other impurities. Last year I was forcibly struck with this coming from the Upper Provinces after three months absence. The climate of Hazareebagh is sensibly cooler than either that of Bengal or Upper India, more so than can be accounted for by the difference of elevation. Taking the height at 1,800 feet and calculating by the usual rough rate of one degree of temperature to 300 feet, this would only give it 6 degrees cooler, which is hardly sufficient. I should estimate Hazareebagh at 8 or 10 degrees cooler than most Indian stations. The climate is certainly more variable in temperature. I consider the climate excellently adapted for European troops, especially for recruits fresh from England to get acclimatized in a moderately tropical climate like Hazareebagh before being exposed to the fierce heats of other stations. As regards precautions, open airy barracks with good ventilation and plenty of light are of course to be recommended. There is not the same necessity for thick thatch under the tiles of the roof. The rains being heavy and the climate somewhat variable during eight months of the year, very light clothing is not advisable. In the rainy season a flannel or woollen belt round the abdomen would be a useful precaution against the dysentery and diarrhœa which prevail in these months. Although the air is cool, the sun is nevertheless markedly a tropical sun, and care should be taken not to have drills and parades too late in the morning or too early in the afternoon. Helmets and cap covers should be worn at morning and evening parades from the 15th March to the 15th October. The most unhealthy months here, as at other stations, are those at the end of the rains and before the cold weather has fairly set in. These are September, October, and November. Last year, which may be considered somewhat exceptional, the sickness continued into December. December to April inclusive are the most healthy months. Cholera is said to prevail sometimes in the latter end of April and in May. In the rains, fevers of the typhoid type, remittent and intermittent fevers, and bowel affections are the most common diseases. As the cold weather advances the continued and remittent type becomes rarer, most of the cases assuming the intermittent character. The jungles are not safe until the beginning of December. In September, October, and the early part of November they are very fatal and deadly. 4. I know of no district near the station so healthy as this is. The hill of Parisnath, about 50 or 60 miles distant, is much higher, and of course much cooler, and is supposed will prove very salubrious, but it has yet to be tried. Steps are now being taken to adapt it for a sanitarium for troops. The table land at the top is, I believe, somewhat confined for barracks, but everything else is in its favour. The height is between 4,000 and 5,000 feet, and there is a good supply of water, and, of course, good drainage. 5. I have served at the following stations, enumerated in the order of their salubrity. Rawul Pindi, very healthy. Hazareebaugh „ Simla „ Jhelum „ Bareilly, healthy. Benares, hot, but healthy. Loodiana, not healthy. Delhi (old cantonments), very unhealthy. Banda, very unhealthy.
III. Sanitary Condition of Station.	1, 2, and 3. Plans attached. 4. The following table gives the accommodation:— Date of construction of barracks at Hazareebagh, 1858–59. Total number of barracks, 15. Total regulation number of non-commissioned officers and men, one regiment of British infantry.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms, or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft.		Ft.	Ft.
10 Temporary Barracks on the standard plan, for single men.	100	300	20	18	108,000	1,080	63	1½	56 fanlights	1	4½
Five temporary Barracks on the standard plan, for married men.	24	300	20	18	108,000	4,500 per family.	200 per family.	1½	56 fanlights	1	4½
One main Guard.											
Guard Room - - -	20	60	20	18	21,600	1,080	63	1½	10	1	4½
One Building.											
Prison Cells - - -	20	8	6	18	17,240	864	48	1½	Pigeon holes, 6 to each cell.		

5. There are no windows in the Hazareebagh temporary barracks. The doors are planks secured by battens with glazed fanlights 4½ × 1 over them, as per standard plan. There is a verandah 10 feet wide on both sides, as per standard plan. The verandahs are never used as sleeping quarters. There are no jhilmils.
6. In tents, on the march, no bedsteads are allowed, only straw. In barracks the bedsteads are iron-hooped cots. These possess the great advantage of being cool, and do not harbour

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References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	vermin. Those in use at present are not high enough to admit the soldier's chest to be put under them. It would be an advantage if this could be done, as it would give more room in the barrack when the chest is not in use. The ends of the hoops should in all cases be continued round and screwed into the wood underneath. When they are fastened at the side the least projection tears the bedding and the clothes of the men. Without a mattress these iron hoops are at present too far apart. They might either be brought closer or a bamboo matting be allowed as a cover before putting on the bedding. The men get as bedding, each 1 cotton setringee, 2 cotton upper sheets, 1 quilt of double chintz containing 8 lbs. of carded cotton, 1 good country blanket. After the first issue they get annually 1 quilt and 1 sheet; 1 blanket every second year, 1 setringee every third year. On issue of new bedding the old articles are kept till worn out. 7. The regulation tent for European soldiers is double poled, with single standing kanâts (or sides), two flies and four doorways. It is intended for 16 men in health, and 8 when for hospital use. The dimensions are as follows: length, 20 feet; breadth, 16 feet; height of the kanâts, 5 feet; height of poles, 11 feet; distance between poles, 6 feet; superficial area for each man, 20 square feet; cubic space for each, about 140 cubic feet. 8. The barracks are all provided with ridge ventilators, running their whole length, according to standard plans for temporary barracks. They have in addition fanlights over each door, which are made to turn on pivots so as to open and shut at pleasure. The guard rooms have the same. The means of ventilation are quite sufficient, because in most seasons one or more doors can be kept open. It would be advantageous to have outside jhilmil doors, and half-glass doors in place of the present wood ones. Punkahs are pulled from April to September, but it has never been considered necessary in the comparatively temperate climate of Hazareebagh, to employ the other usual means of tatties and thermantidotes. 9. Barracks are constructed as per standard plan; foundation and plinth of burnt bricks in mortar; superstructure to a height of 10 feet burnt bricks; in round arching ditto; remaining portion of superstructure, sun-dried bricks in mud; roof of tiles, over 3 in. of thatch. The tent kanâts or walls and fly tops are double, and of four folds of cloth, strengthened with coarse tape where the rope bears. There are no huts at the station. 10. The floors are of bricks laid flat and on edge, also of stone and terraced. The flooring of barracks is 2 feet above the ground, and of hospitals 4 feet. No passage for air passing underneath is provided nor deemed necessary in this station. 11. The committee consider that the materials and construction of barracks are suitable for the climate. With regard to tents, the committee are of opinion that it would be an improvement to keep the flies entirely separate; at present the outer and inner flies are sewed together in their entire length, where they meet the kanâts or standing walls. This plan saves ropes, but the tents are more likely to leak, and there is little or no ventilation between the flies. By keeping the flies separate, and bringing the outer ones a few inches beyond the standing walls, the tents will always be water-tight, and a free circulation of air always admitted between the flies. By keeping them separate, however, extra ropes are necessary for the outer fly; sewed together, as at present, the same ropes answer for both flies. The barracks and cantonments are kept in repair by the barrack master and executive engineer. Repairs are always executed promptly. The commanding officer is responsible for the general state of the cantonments; and the senior medical officer is *ex officio* sanitary officer. Walls and ceilings of barracks are cleansed and limewashed annually; generally in April and May; oftener, if necessary, on medical officer's requisition. 12. There are 10 double lavatories, and 1 single; each lavatory is provided with cisterns to hold water. Pipes and taps communicate with these cisterns, and over each basin is a tap. The dirty water passes off by a plug at the bottom into a permanent covered drain, which is carried off by a main drain to a distance of three quarters of a mile from the barracks, where it falls into the main drainage of the station, which has a good fall, and is rapid. 13. Cookhouses are of the standard plan, and the water supplied by water carriers. The refuse water is carted away to about 1½ miles from the barracks into a rivulet, whose fall is rapid. There are no particular arrangements for washing; the clothes are washed instanter, and are dried in the country in less than half an hour. 14. Privies and urinals are of the standard plan. Each privy seat is provided with a bucket of iron, and each urinal with urinary pan and iron bucket. All filth and urine is carted to a distance of 2 miles from the barracks, where is a rapid rivulet. 15. All privies are built on the standard plan. They have ridge ventilators, and have 4 doors and 6 windows. They are lighted by one lantern suspended from the roof. 16. All filth from privies and urinals is caught in buckets, pans, &c., and carted away 2 miles off; so with the refuse from cookrooms; the remainder, such as washhouse water, is caught in a covered drain. There are in all 1,825 square feet of washhouse drain communicating with 15,610 square feet of main drain. The country here being naturally undulating, surface drainage vanishes rapidly. All drainage from lavatories, baths, &c., passes off rapidly by the covered drains as noted above. No part of the barrack is damp. No cesspits exist at the station, nor are there any foul ditches. 17. Every day a cart perambulates cantonments, attended by 2 sweepers. All refuse, dead leaves, bones, ashes, &c., are carried away to a distance of some 2 miles. 18. Vegetation springs up very rapidly in the rains, but is kept down as much as possible by the barrack master's department. There are no old walls, but the aloe hedges already mentioned are inclined to grow too luxuriantly. Measures are being taken to keep these within proper limits; and some, which, from proximity to the barracks, are considered objectionable, are to be removed entirely. 19. The water supply for the bazaar is sufficient, and the streets are kept clean. There is not more crowding than is observed in all native bazaars, but latrines are very much required. The bazaar is open, and well ventilated. The natural fall of the ground ensures a complete drainage with very little care. The occupants of the houses in the bazaar are responsible for keeping the roads in front of their dwellings clean and regularly swept. The bazaar chaprusies are employed as a part of their duty to see that the regulation is enforced. No accumulations of filth are permitted. There are no dungheaps or cesspools near or at the station; but the first half mile out on the Burhee road, and other roads leading out of the town, are in an offensive state, from being resorted to by the natives in the absence of

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Troops—*cont.*	latrines. It is contemplated to establish latrines at once on the principles of those at Agra and other large stations. No nuisance is experienced in the barracks from wind blowing over the native dwellings. 20. There is one slaughter house for the use of the soldiers conveniently situated in an isolated spot about half a mile from the barracks to the south. At no time has any nuisance been experienced from it, and it is kept clean, all the offal being carted away. It is at some distance from every other building; and the wind at Hazareebagh very rarely blows from that quarter. 21. Very few horses are kept at the bazaar; and, as no nuisance whatever is experienced from them, no special rules seem to be required. The manure is either carted away with the other filth or is taken specially as manure by the owners of gardens. 22. No troops of cavalry or artillery are at present located at Hazareebagh. 23. The accommodation for the married men being ample, no women are obliged to occupy barrack rooms with the men.
Officers' Quarters.	1. What has already been said in regard to the drainage of the station applies equally to the officers' quarters. The officers occupy several detached houses, and one long barrack partitioned off into rooms is especially given up to the unmarried officers. These rooms would be hot in any other station, but are well suited to the climate of Hazareebagh. They are well raised and ventilated. For temporary quarters they are very good, but more servants outhouses are required.
IV. Health of the Troops.	1. I should say that the inhabitants of the station and the population of the district enjoy at least an average share of health. The latter are for the most part a poor puny race, owing perhaps to their poverty and insufficient unstimulating food. Rice is the only grain consumed. 2. The most prevalent disease is unquestionably fever, particularly of the intermittent type. Bowel complaints are not uncommon. Spleen disease is always found where fever extensively prevails, but I do not consider it a marked peculiarity of this district. Of epidemics, cholera and small pox are the most common and the most fatal. There are every year a few cases of the former at the setting in of the hot weather. 3. The general healthiness of the native population is probably attributable to their very simple habits of life, and to their being but little addicted to the use of ardent spirits. What unhealthiness there is may be put down to the jungle, malaria, and rice cultivation. 4. The regiment is now being raised at the station, and is for the most part composed of recruits fresh from England, who have, however, for one or two months previously, remained at the Barrackpore recruit depôt. They have for the most part arrived at Hazareebagh in good health, but more than one party have suffered on the road up from cholera. About 80 out of the 520 of which the regiment consists are volunteers and drafts from other regiments. The most prevalent diseases have been fevers, remittent and intermittent, venereal diseases and bowel complaints. No. 1 company was markedly more unhealthy than the others, as appears from careful statistics of admission from fevers and other malarious diseases kept for July, September, October, and November of last year. The next barrack to No. 1, occupied by No. 3 company (though marked No. 2 on the executive engineer's list), ranked next in point of unhealthiness. This comparative insalubrity was attributed to the proximity of a large rank aloe hedge which shut out ventilation to the north, and also to the jungly state of a private compound which approached that barrack, being divided from it only by the aloe hedge above mentioned. The hedge is to be removed and a low wall substituted for it, and care will be taken this year that the compound is kept clean and free from jungle. 5. The state of the troops has not been such as to require that they should have been camped out either in 1858 or 1859. They have been very healthy years on the whole. 6. I have never been in charge of troops at a hill station, but have had some general experience of hill climates. For healthy men visiting the hills the effect is almost always favourable. For invalids more caution is to be observed as the hills are quite unsuited to many diseases, especially to bowel complaints, hepatic and other visceral affections, with organic lesions. Contrary to generally received opinions, I consider a hill climate favourable to most lung diseases, especially in incipient phthisis. 7. I cannot say whether troops returning to the plains from hill stations are more or less liable to attacks of febrile and other diseases. 8. Although I have not had charge of troops at hill stations, I have been on several occasions on leave at Landour and Mussourie, and held medical charge at Simla for an entire year. My general opinion is that well-selected hill stations are very favourable for European troops. Some of our hill stations, as Subathoo and Kussowlie appear to have been ill chosen, although I understand the latter is recovering its reputation as a sanitarium. 9. Not having had extensive experience I can only give a general impression, taken up in the course of several visits to the hills, that persons coming from the heat of the plains to the cooler climate of the hills, suffer frequently from bowel complaints. The free action of the skin being suddenly checked may probably be regarded as the exciting cause. This is well known in the case of persons visiting Simla, and before they get acclimatized to the station. 10. I consider that warm clothing and shelter are the most essential points to be attended to at hill stations. As a general rule all people coming from the plains are apt to under clothe themselves. If soldiers have a sufficient stock of clothing to allow them to change their wet clothes after exposure to rain, I consider that it would be of great advantage to teach them to disregard the weather. At present it is too much the fashion to coop the men up on rainy days in their gloomy hill barracks where it is too dark to read or employ themselves profitably. 11. In the hot weather and rains the most good is doubtless obtained indirectly by escaping the same unhealthy and exhausting seasons in the plains, but to derive the full benefit of a hill climate, troops and especially invalid troops should in my opinion remain over the winter months, leaving, according to the distance they have to travel, some time in February. I should think two hot seasons and one winter the very shortest time to enable troops to obtain the full benefit of a residence in the hills. 12. I should say there is no fear whatever of injury to health from any length of residence at the hills.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	13. I am not aware of any special precautions required on returning to the plains, except such as would naturally suggest themselves for protecting men from the fiercer heat of the plains after they have been accustomed to expose themselves without risk in the cooler climate of the hills. 14. Considering the matter only in a sanitary point of view, and supposing the hill stations to be judiciously chosen, most good would in my opinion be derived from making the hills the normal residence of the European troops, giving the corps short periods of service in the plains. Troops undergo a certain amount of tropical acclimatization even in the hills. The sun is always a tropical sun, and the climate partakes of the same character, cool as the air may be. I should therefore consider that troops visiting the plains after a lengthened hill residence are not to be placed in the same category as unacclimatized troops, fresh from England. I reason, however, only from general impressions, and have no statistical data to guide my opinion. If from any particular cause a regiment is unhealthy at a station it is no doubt an advantage to remove it, but very possibly the regiment succeeding it may not suffer in the same degree. As a general rule I am of opinion that troops are moved too frequently, considering the question in its sanitary aspect. There are climatic peculiarities in each province, and troops have always to undergo a certain degree of local acclimatization in each. I believe it will be found that the health of troops is better the second year than the first, and the third year than the second. I put aside of course the cases of those unhealthy stations where the exciting causes of sickness being in constant operation, the general tone of health of the regiment is day by day gradually lowered. 15. I have not experience to enable me to give a decided opinion whether the barrack and hospital accommodation in hill stations is sufficient. 16. I have no experience to show at what elevation the most suitable sites may be obtained. 17. The only higher ground near the station, and which I only know by general report, is the hill of Parisnath, about 60 miles distant, and I believe about from 4,000 to 5,000 feet high. I have no personal knowledge of its capabilities as a hill station. 18. All sandy and porous soils which do not retain water, and those which are rocky though often hotter, are I conceive as a general rule more healthy for stations, *cæteris paribus*, than the richer vegetable loams and clays. 19. I consider from 20 to 25 the best age for soldiers proceeding to India, and from the 15th October to the end of December or January, the best period for them to land. I do not know how troops are disposed of on first landing. Next to choosing the proper season for landing the troops, the best means of preserving their health would in my opinion be to forward them as quickly as possible to their respective regiments. Detention in the river or in the neighbourhood of Calcutta must for many obvious reasons be most prejudicial. 20. I do not believe that any advantage is gained by sending the troops to some intermediate station in the hope of gradually acclimatizing them to the tropical peculiarities of India. A regiment which came lately from the Cape to India suffered, I believe, more than many others coming direct from England. I should certainly consider it an advantage if all fresh troops were sent in the first years of their service to hill districts, or to those stations which experience proves to be specially adapted to young soldiers fresh from England. Hazareebagh is eminently one of these stations. 21. The three modes of transport now employed from the port to the interior are, 1st, (if by water,) river steamers as far as Allahabad; (if by land) either daily marching or Government bullock train. By daily marching the progress made is from 10 to 14 miles in the 24 hours with one halt in the week. By Government bullock train it is about double that distance. The best precaution of all is moving troops at the proper season of the year, that is to say, in the cold weather, and, if by water, guarding against the undue crowding of the steamers. In time of war or other emergency this may not always be practicable, but in peaceful times no consideration should induce the authorities to overcrowd the boats. Probably nothing is healthier than daily marching in the months of November, December, January, and February, and (if in the upper provinces) March. After that month and more particularly in Lower Bengal, cholera is very apt to make its appearance. The advantages of the bullock train are, 1st, its rapidity as compared with marching. 2nd, that tents are not required for the accommodation of troops on the road, as temporary stations have been formed along the trunk line at proper intervals. The arrangements of the Government bullock trains for the transport of troops, first organized in the times of the mutiny, appear very good. It is to be expected, however, that a few years will see all these methods superseded in most cases by the rail. Already 120 miles of rail, from Calcutta to Raneegunge, and again from Allahabad to Cawnpore, are habitually employed for the purpose of transporting troops. 22. Due regard being had to economical and sanitary considerations, I am of opinion that from 15 to 18 years should be the limit of a soldier's service in India. 23. I am not sufficiently acquainted with the working of medical boards to say whether the manner of conducting business is such as to avoid conflict of opinion as regards invaliding. 24. The time of year desirable for invalids to leave India is towards the end of the cold weather, as this enables them to march to the port of embarkation in the healthy season.
Diseases.	1. There are regular inspection parades every Saturday forenoon, chiefly with a view to discover venereal disease in its early stages. 2. There has been no scorbutic disease at this station since I have been here. If it ever occurred, which I do not think likely, it might safely be attributed to some error in diet, and ought readily to be checked by the free use of lime juice and green vegetables. 3. In 15 months, out of an average strength of 338 men, there have been only 9 men admitted on account of hepatic disease, and of these all but two were chronic cases contracted elsewhere, and occurring in men drafted from other corps. Acute hepatitis and hepatic abscess are very uncommon at Hazareebagh. 4. There have been no admissions on account of filaria dracunculus, but the disease is known in the district, though it does not prevail even among the natives to any great extent. 5. At most seasons of the year at least one-fourth of the men in hospital are there either on account of gonorrhœa or syphilis, primary or secondary, and many of those returned as rheumatism probably owe their rheumatic pains to some syphilitic taint. In the months when fever is prevalent, of course the proportion is not maintained. In 15 months 291 venereal cases are recorded, out of 1,416 total of all other diseases, or 20·55 per cent. Next to

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	drunkenness, I consider syphilis to be the great curse of the army, and the question is certainly a difficult one to handle. Most of the methods employed in various regiments in this country resolve themselves into the maintaining of regimental brothels, that is to say, certain prostitutes are permitted to exercise their calling in the regimental bazaars, and are regularly examined, reported on, and removed when diseased. This is exactly the French system in Paris and other French towns, and of its efficacy there can be no doubt. Were it not impossible to recognize such a system on moral considerations, there would be comparatively little difficulty in keeping the regimental bazaars untainted. Stringent bazaar regulations, and a regular examination of the prostitutes, would ensure this result. The English Government, however, have always wisely refused to extend this practice to London and other English towns, and surely it is equally immoral, however customary and expedient, to resort to such a system in a regiment. I would refuse as a medical officer to lend my sanction to the practice by examining the regimental prostitutes, while I fully acknowledge its sanitary expediency. I confess at the same time I know of no other remedy for this frightful evil. I do not consider that there would be much advantage gained by establishing lock hospitals for the women. They are generally most unwilling to come to the doctor when diseased, and would certainly not resort to the lock hospital except under compulsion.

6. The troops at the station suffer from diseases of the epidemic and endemic class, especially in the months of September, October, and early part of November, such as fever, dysentery, and diarrhœa.

Fevers are continued (assuming the typhoid type towards the end of the rains). Remittent and intermittent (the last the most common of all).

Dysentery and *diarrhœa* are also prevalent at those seasons; the former, known as hæmorrhagic dysentery, being the most fatal.

Cholera did not occur here last year as an epidemic. Five cases are recorded in the hospital returns since 1st December 1858, but these occurred amongst the draft which came from Barrackpore depôt, and the disease was in all cases contracted on the road.

Small-pox.—No case has been recorded since the regiment was formed in November 1858.

Rheumatism is somewhat prevalent; 60 cases are recorded, but many of these might, perhaps, be regarded as partly syphilitic in their true character, rather than idiopathic rheumatism.

The average strength of the regiment for 15 months has been 338. Total of all diseases, 1,416; of these, 433 have been fevers; continued fevers, 54; remittent fevers, 23; and intermittent fevers, 356; Dysentery, 61; diarrhœa, 119; cholera, 5; small-pox, none; rheumatism, 60; other diseases, 738; or, per cent.,—

Admissions.

Continued fevers	3·813
Remittent do.	1·624
Intermittent do.	25·143
Dysentery	4·3078
Diarrhœa	8·404
Cholera	0·3531
Small-pox	·00
Rheumatism	4·2371
Other diseases	52·118
Total	100·000

Deaths.

Continued fever	1
Remittent	2
Intermittent	1
Cholera	1
Dysentery	3
Diarrhœa	0
Small pox	0
Rheumatism	0
Other diseases	5
Total	13

7. The remittent and continued fevers have generally cerebral complication, and after the first few days assume a typhoid character, requiring stimulants to be freely administered. The bad dysentery cases, particularly those known as hæmorrhagic, are attended with little tenesmus, but there is great ulceration, thickening and disorganization of the mucous coat of the large intestine, terminating in extensive sloughing. Many of the cases, entered as diarrhœa, and apparently not dysenteric at first, assume the dysenteric form very rapidly. The seasons when these diseases are most prevalent are the months of September, October, and the early part of November. The sun is powerful at that season, the atmosphere humid, and the vegetation rank. The air is impregnated with malaria from decaying vegetation. No portions of the bazaar or native dwellings have been observed to be more affected than others, and I am not aware of any habits or conditions among the troops or natives, which appear to predispose to disease.

8. Every care being taken not to expose the men to the sun at morning parades and drills, and dry ground being chosen for these duties in the rainy season, the prevalence of epidemic diseases cannot be said to be at all increased by any duties or occupation of the soldier. It is rather the want of all occupation which predisposes men to their attack. Listlessness and vacuity of mind react injuriously on the bodily health.

9. Quinine has never been tried among the troops, for the simple reason that the surgeons indents are kept rigidly down to the bare requirements of those actually sick; but from partial experiments made by myself, and from what I have heard mentioned by others, I have not the slightest doubt that a grain of quinine, daily administered as a prophylactic, just before and during the unhealthy season, would diminish the prevalence of fevers and malarial dysentery 50 per cent. or more, but the consumption of quinine, and the expense, already great, would be enormous.

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IV. Health of the Troops: *Diseases—cont.*	10. In the unhealthy months, and particularly when dysentery and other bowel complaints are prevalent, I consider that an abdominal belt of flannel, or similar material, ought to form part of the soldier's kit, and be worn as a matter of duty. When exposed to the sun on field service, something corresponding to the native cummerbund might advantageously be served out. It is a mistake to suppose that the head is the only part of the body which suffers from exposure to the sun's rays. All healthy out-door games should be encouraged whenever the weather admits, and everything which affords healthy occupation for the mind. Reading-rooms, and all indoor games which do not lead to gambling, are wonderfully conducive to health.
V. INTEMPERANCE.	1. The soldiers at the station, as a body, are very temperate. There may be many men who habitually take more spirits than can possibly be *good* for them, but I know of no single man who could be called a confirmed drunkard. 2. No returns have been kept of the proportions of admissions into hospital, directly caused by intemperance. Only eight admissions from drunkenness and delirium tremens are recorded. Of those *indirectly* caused by intemperance, I doubt if it would be possible to give even an approximation by the most careful return. For instance, a soldier, while the worse for liquor, may lie out in the wet, and return to barracks sufficiently sober to escape notice. While exposed, he may have taken in the poison of a malarious fever, or of acute dysentery, or of many other diseases, and yet it would be impossible for the hospital records to give this admission as "indirectly" caused by intemperance. I believe myself that it would be under the mark to say, that one-third of the diseases of, and one-half of the crimes committed by, soldiers may be put down to the effects of drink, directly or indirectly; but I have no statistical data to give which would be satisfactory. Drunkenness is punished as an offence. 3. Spirits are sold at the canteen, but the sale is prohibited in the bazaars. The canteen rum is 24 per cent. under proof. The amount which each man is allowed to take is 2 drams, or $\frac{1}{20}$th part of a gallon. The amount actually consumed in 1859 was 2,020 gallons. The average monthly strength being 323, this gives the annual consumption per man very nearly 6·25 gallons. The canteen returns show spirit drinking to be decreasing. The first two months of the present year give a little over the rate of 3½ gallons per man per annum. Some of the improvement may doubtless be put down to the men being under stoppages, and unable, therefore, to afford much liquor; but a good deal, it may be hoped, is real improvement. Spirits can never be said strictly to form part of the daily ration of the soldier; he is allowed to draw a certain amount, paying for the same. At the station and on the march he is allowed to take either beer or rum: a quart of the former or 2 drams of the latter; or he may take one part of beer and 1 dram of rum. In the field, from the impossibility of transporting beer, only rum is issued. No rum is issued in the field till afternoon, and, in quarters, not till after evening parade. Beer, however, is allowed even in quarters in the middle of the day. It would certainly be injurious to allow it to be issued in the early morning. No man on the convalescent list is allowed to enter the canteen except by special permission, and that is given by the surgeon very rarely. No other drinks are sold at the canteen or bazaar which are injurious to health. 4. In my opinion, the consumption of spirits is decidedly injurious to health, and is certainly not conducive to the efficiency and internal discipline of the corps. 5. I consider that it would be in every way beneficial to abolish altogether the sale of spirits in the canteen and bazaars. Most medical men of the present day have, I believe, come to the conclusion that the habitual use of ardent spirits even in moderation is injurious, and certainly the long-cherished idea that the British soldier required daily drams to maintain him in health and efficiency is now thoroughly exploded. I feel fully convinced that the man who drinks nothing stronger than tea or coffee will do more work, *cæteris paribus*, than the dram drinker, even though the latter be what is called in the regiment a sober man. The argument that the soldier will get drink somehow, and that therefore it is better to provide him with a certain amount of good spirits from the canteen rather than force him to seek worse elsewhere, I conceive to be entirely erroneous. Stringent regulations could in most stations make it impossible for the soldier to obtain liquor in the bazaar; and, even were it otherwise, I believe that the serving out of spirits from the canteen, far from checking the desire, creates an artificial thirst, and a further craving, which the soldier seeks to gratify elsewhere. At first, doubtless, the large quantity which each man is allowed to take from the canteen suffices to satisfy him, but gradually his stomach requires a further daily stimulus, and he will use all his energies to procure it. I have no hesitation in recording my opinion, that the selling of rum in the canteen is an unmitigated curse to a regiment, destructive alike to health and discipline, and that to this more than to anything else we owe the great number of drunkards which disgrace our army. 6. I do not consider that even malt liquor is necessary to health in this country, but am not prepared to say it is injurious, if taken in moderation. It is, at all events, much less injurious than strong brandied wines and spirits. 7. I think coffee, tea, lemonade, and similar drinks are more used at this than at other stations; and I believe it will be a happy day for the army when nothing stronger is issued to the troops. 8. It would certainly be beneficial in every way to suppress altogether the spirit ration. 9. It would be beneficial in every way to prohibit the sale of spirituous liquors in the canteens. 10. I have no recommendation to make, except the entire abolition of the custom of issuing spirits at all from the canteens, and giving, perhaps, some trifling compensation for taking away the indulgence. 11. The canteen regulations are as follows:— 1. The canteen will be open daily from 12 to 1 o'clock for the issue of malt liquor, and from 6.30 to tattoo for the issue of rum. 2. No malt liquor to be issued before 12 o'clock. 3. The quantity of malt liquor and rum sanctioned per man is 1 pint of ale or porter and 1 dram of rum daily; or 2 drams of rum, without ale or porter. 4. One pegging serjeant or corporal from each company will attend at the canteen during the issue of all liquor, for the purpose of seeing that no man has more than his proper allowance. 7. No liquors to be taken from the canteen without a written order from the commanding officer; and no strangers are on any consideration to be allowed to enter the canteen.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	11. No liquor to be sold on credit. N.B.—The other canteen regulations relate to the keeping of order, instructions to the non-commissioned officers how to act in case of disturbance, &c., but do not bear directly on the question under consideration. There are no liquor shops established in the bazaar, and no bazaar regulations beyond their prohibition altogether in cantonments.
VI. Diet.	1. It is not positively known what is the ration for Queen's British troops, but it is presumed to be identical with that of the other European troops in India. For European troops in the Indian army the ration is composed of beef, mutton, rice, coffee, tea, bread, sugar, and vegetables according to the season, in the following quantities:—Meat, 1 lb., vegetables, 1 lb., rice, 4 oz., coffee, $\frac{5}{14}$ oz., tea, $\frac{5}{7}$ oz., bread, 1 lb., sugar, $2\frac{1}{2}$ oz., and no periodical change is made. Before issue the rations are inspected by the mess orderlies of companies, who make known any objection they have to them. They are then inspected by the quartermaster and orderly officer of the day, and if they are considered of bad quality, the contractor has the option of changing them. Should he decline to do so, a committee is called, composed of the captain on duty, orderly officer, and medical officer, and if deemed unwholesome, it is buried or destroyed; if only of inferior quality and not positively unwholesome, the contractor is directed to supply fresh. 2. The ration includes only vegetables, no fruit, for which the stoppage is 3 annas and 4 pice per diem. The soldier takes three meals daily, viz., Breakfast at 8 a.m. in the hot weather. Dinner at 1 p.m. ,, Tea at 4 p.m. ,, In the cold weather each meal an hour later. About 27·5 per cent. of the ration is vegetables. Rice is not considered a vegetable. 3. In my opinion there ought to be two scales of diet, one for the hot, and one for the cold weather. The hot weather scale should provide less meat and more vegetables, and farinaceous food. In the cold weather the soldier, when not on duty, is generally out of barracks either walking about or engaged in games which call for a considerable amount of physical exertion. In the hot weather he is not even permitted to leave his barrack in the heat of the day, and too often he spends a listless lazy life, half asleep perhaps the greater part of the time. It stands to reason that the diet should be changed to suit his altered circumstances. I think, too, that the soldier's diet is too unvarying. Dall, soojee, oatmeal porridge, and many other articles might be employed both with economy and advantage. 4. The means of cooking are by the ordinary choolas or cooking places. Copper frying pans and the usual cooking utensils are supplied on indent by the Commissariat department. The kitchens are kept clean, are light and well ventilated, and amply supplied with water. The food is prepared in every variety of way. The cooking is very fairly done, and as much varied as the stereotyped nature of the raw articles admit of. There are seldom complaints on this score. The tea and coffee are properly prepared. The regiment in this station has not yet made regular marches; but the usual method would be adopted of providing tea or coffee at the half-way halting ground. 5. At present, this being a young regiment, and the men much employed in their drill and duties, they would have but little time to work in their gardens; but ultimately there cannot be a doubt that the establishment of gardens for the cultivation of vegetables by the soldiers would be in every way advantageous. The committee consider that it would be advisable, after selecting a proper piece of ground sufficiently near to the barracks, that the whole should be laid out on one general plan, and while it should be understood that vegetables and useful wholesome fruits should be the chief produce looked for, the cultivation of flowers and ornamental shrubs would also be encouraged. At least as much benefit might be anticipated from affording the soldier a healthy, pleasing occupation, as from the value of the garden produce. After the ground had been thus laid out on a general plan, portions should be subdivided off for the different companies. Small prizes might be given once a year for the best flowers, fruit, and vegetables; but even without this inducement a wholesome rivalry would doubtless spring up between the different companies, who would vie with each other in perfecting their several plots. Seed should be supplied by Government, and the vegetables purchased at a fair rate by the Commissariat, if there were at any time a surplus available. It should also be a standing regulation of the army that a corps succeeding another at a station should be bound to purchase the soldiers' garden at a fair valuation.
VII. Dress, Accoutrements, and Duties.	1. The component parts of a soldier's dress are according to regulation. Dress during cold weather months, from the middle of October to the middle of March, consists of a cloth tunic or shell jacket, cloth pantaloons, ammunition boots, forage cap, and great coats on guard at night when required. Dress during hot weather months, khakee (drill dyed of a drab colour), tunic and trousers, wicker helmet, with khakee cover and turban. Under clothing: flannel shirts, white or blue cotton shirts and cotton socks. Accoutrements: pouch belt and pouch, with 40 rounds of ammunition, expense pouch, waist belt, bayonet and scabbard. I consider the dress suitable. Either the hot or cold season dress, or a mixture of the two, as may be required, appears well adapted for all the stations and climates I have known in India. The helmet might, perhaps, be improved upon and rendered more sightly and convenient. Men on guard wear the dress of the season, and their great coats, if considered necessary. The guard-house affords ample protection from the sun and wet.
Duties.	1. As a general rule, I should think that drill and exercise, so far from being prejudicial to health, were conducive to it. 2. Guard comes round about once in five days; the hours of drill are an hour about sunrise, an hour in barracks, about 10 a.m., for those men who require it, and an hour about sunset for all. The men do not appear to suffer in health from this. The early morning is generally the best time for drills, parades, and marches, but circumstances may, of course, render other hours preferable. I am not aware of any general orders which prohibit a commanding officer from using his own discretion in these matters. The men have four nights out of five in bed.

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*cont.*	3. The barracks are from 50 to 200 yards distant from the ground where guards are mounted. All guards are relieved daily; they go on for 24 hours. The roll is called at daybreak, at breakfast hour, at dinner hour, at tea, also at tattoo in the evening. On days when there are no parades, roll is called at the hours of morning and evening parade. I am not aware that the night guards have, in any instance, been considered prejudicial to health. The only precautions observed are the adoption of woollen clothing, and the men taking their great coats with them when the weather requires it.
VIII. Instruction and Recreation.	1. There is a ball court, but little used by the men. One skittle ground and a second is in course of erection. There is a regimental school, with two soldier assistants. The services of a trained schoolmaster have not yet been secured. There is a Government library, which is not lighted at night. The soldiers have a temperance reading room, with upwards of 200 members, which is well lighted at night. This room is the only institution of the kind which can be considered a club or day room. There are as yet no gardens. There are armourers', shoemakers', and tailors' shops. A small theatre has been established in one of the barracks. Quoits, cricket, and other out-door games are a good deal played by the men when the weather is cool enough to admit of their being out of barracks, but there is no gymnasium. It would be advisable, if practicable, to afford further means of amusement and occupation, as the long days of the Indian hot weather hang heavily on the soldiers' hands. During the hot months the men are not allowed to leave the barracks after the sun becomes hot, except for the purpose of visiting the reading room, and the result is beneficial to health. 2. As the regiment has only lately been raised, and consists principally of recruits, who have to be instructed in all their drills and duties, there has been no time as yet to devote to soldiers' gardens, but I hope soon to establish them. 3. The savings of the soldiers are at present lodged in the Government savings bank, but it has been decided that regimental savings banks shall be instituted from the 1st May next. 4. During the greater part of the day the men, if they please, can take exercise in the verandah of the barracks without injury to their health.
IX. Military Prisons.	1. The cells of the military prison are 20 in number, and each contains 1,365 cubic feet of air, being 10 feet long by 7 feet broad, and 19½ feet average height. They are inefficiently ventilated and are very dark, having only 4 small holes above the wooden door, to admit air and light. Being of tiled and thatched roof, there is some irregular ventilation between the top of the walls and the grass. They would not be habitable in their present state in the hot weather in a station of the plains of India, but I have not observed any bad effects on the prisoners at Hazareebagh. The longest term of solitary confinement permitted at one time is 14 days; but it is rarely awarded as a punishment for more than 168 hours. The state of the cells as regards light and ventilation has some time since been brought before the notice of the proper authorities, and immediate alterations are to be made.
X. Field Service.	1. There are no local regulations for field medical service which are not included in the general presidency regulations. 2. The recommendations of the medical officer would always be attended to in the course of ordinary marches, as well as on field service, where strong military reasons did not prevent his suggestions being adopted. In the event of an epidemic such as cholera breaking out he would practically have plenary powers to carry out any changes he might consider advisable. No commanding officer would be willing to accept the responsibility under these circumstances of refusing to attend to his suggestions, though necessarily possessing the full power to do so. 3. In the course of the ordinary relief of regiments, the camping grounds are certain fixed spots, marked out by boundary pillars, which have been carefully selected and set aside for this purpose, and are presumed to be the best available in the neighbourhood. The first points looked to in the selection are abundant water supply and natural facilities for drainage. Wells are sunk when the water supply afforded by the wells of the place is insufficient. Should a regiment be marching through a new country not so marked out, it would be the duty of the quartermaster to select good camping ground. There is generally ample room for making a good choice, and any interference of the medical officer would, for the most part, beuncalled for. Doubtless here, as elsewhere, his suggestions, if he thought it necessary to make any, would be attended to. In a standing camp more especially his advice would probably be taken, or even asked for. The present system works so well, and the medical and military authorities, as far as I am aware, so seldom clash in these matters, that I consider no alteration called for. 4. I am unable to give the details as to the arrangements for field hospitals, ambulances, transport of sick, &c.
XI. Statistics of Sickness and Mortality.	1. These could only be obtained at the office of the Presidency Inspector-General.
XII. Hospitals.	1. Plan annexed. 2. There are two hospitals, one for the men and one for the women of the regiment. These are in one line, and separated by about 50 or 60 paces from each other. The nearest barrack is distant about 350 yards. There are no stables in the station. The north boundary of the hospital compound runs along the bazaar and native houses, a thick aloe hedge separating them. The hospital is 100 yards distant from the hedge, the apothecaries' quarters being built on the centre of the intervening space. I think the site excellently chosen, as it is open and freely ventilated, no buildings whatever obstructing it on any side. I consider the site very healthy, and unexceptionable in every way. 3. One of the best wells in the station is across the public road to the east, and it is most conveniently situated for the requirements of the hospital. There are two other wells in the compound, one Government well recently built, containing very good water. 4. All the sewage and impurities from the privies and cook-room are removed by carts to a distance, as in the case of the barracks. The rain water drains off by the ditch in front and outside the hospital wall to the east. 5. The hospitals are similar to the temporary barracks. The plinth is 4 instead of 2 feet as in the barracks above the level of the ground. There are no air passages under the floors. The country about being hilly, very little water sinks into the subsoil. It passes off rapidly

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	into the main drainage to the east. A layer of concrete 10 feet wide, with a slope of 6 inches to 10 feet is spread around the hospital, outside which a small gutter is made. Rainfall disappears rapidly. The foundation and plinth are of stone in mortar. The superstructure of burnt bricks in mortar, and in places in mud. Above 10 feet sun-dried bricks in mud. The floor of bricks laid flat in mortar. Roof of tiles over 3 inches of thatch. The roofs and walls are single exactly similar to the barracks. There are verandahs on both sides 10 feet wide. Open verandahs on the east side. Closed verandahs on the west side. They afford sufficient shelter from the sun's rays. The verandahs have never yet been used for the accommodation of sick or convalescents. The hospital is meant to accommodate 96 patients, namely 16 in each of the 6 wards, and that number has never yet been approached. The hospitals are single storied; plinth perfectly level from end to end. Date of construction, 1858–1859. Total number of male wards, 6. Female wards, 5. Total regulation number of men's beds, 96. Women's beds, 80.

Wards or Hospital Huts, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed's above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft.	Fanlights per ward.		
Single Men's Hospital similar to temporary Barracks, standard plan; 6 wards.	16	48	20	18	17,280	1,080	60	1½	8	1 foot.	4½ feet.
Women's Hospital, do.; 5 wards.	16	48	20	18	17,280	1,080	60	1½	8	1	4½

Both men's and women's hospitals are placed broadside east and west so as to receive the full benefit of the prevailing winds. There are no windows except the fanlights above the wooden doors. I consider that it would be conducive to health and comfort if the present wooden doors were removed and glass doors with separate outside jhilmils or Venetian doors substituted for them.

6. The hospitals have the long roof ventilation mentioned in a former part of this report, and the fanlights above the doors, but for the greater part of the year the climate admits of one or more of the doors in each ward being kept open. At the same time I think the outside Venetian doors and glass half doors would be an improvement. There are no jalousies or jhilmils.
7. The ordinary means of cooling by tatties and thermantidotes have not been considered necessary in this station, where the heat is at no time very oppressive. Punkahs are, however, available whenever the medical officer considers them called for.
8. There are six open fire-places in the west closed verandah placed at regular distances. The walls and ceilings of the hospital are regularly whitewashed once a year, but this can be done at any time on the requisition of the medical officer.
9. The privies and urinaries of the hospital are exactly on the same plan as those of the barracks, and all the arrangements connected with their conservancy are the same. They drain into a masonry well, which is emptied out and the urine and ordure removed to a distance. They are sprinkled with lime and charcoal every day, and are not offensive.
10. The lavatory arrangements are sufficient and are similar in every way to those of the barracks.
11. There are no baths for the sick. They wash in the basins of the lavatory, and can always afterwards if they please get a mussah (or skin) full of water thrown over them by the water carrier, this being the usual method of bathing employed in India. It would not answer when so many patients are in hospital with venereal complaint to have a plunge bath to which all might indiscriminately resort. The present system is more convenient and appears sufficient for all purposes of cleanliness.
12. It is not the custom of the washermen of India to wash inside the houses as in England. The hospital head washerman takes over the foul linen from the steward, and carries it away to some tank or nullah a mile or more perhaps from the hospital. After it is washed it is spread out in the sun to bleach and dry, and is brought back to be ironed or made up in the washerman's own house. This system appears to answer best for India, and is almost universally adopted. The number of dhobies or washermen allowed for the hospital of a full corps is one head washerman and four ordinary do.
13. An outbuilding was formerly used as a store room, but was not found sufficiently dry in the rainy season, and the hospital clothing, bedding, &c., have since been removed to an unoccupied end room in the women's hospital where there is ample space and every protection against damp.
14. The cots are the same as those employed in the barracks and already described. The same remarks apply to hospital cots as to the others, and the same improvements are suggested for them. Unlike those in barracks the hospital cots are supplied with mattresses, but these are seldom sufficiently thick to prevent the patients feeling the iron hooping underneath. A bamboo matting might be advantageously employed. In long bedridden cases it is my custom to serve out two mattresses to the patient as there are almost always spare ones in store. Besides the mattress each patient has one large and two small pillows stuffed with country hemp, two sheets, and one or two blankets if necessary. For uniformity, a chintz covering is stitched over one side of the blanket.
15. Here, as in the case of the wash-houses, the tidiness and appliances of a well-regulated English kitchen are not to be looked for. If supplied, the native cooks would probably not use them, and practically it is better to give them their own simple chulas or cooking places, and the ordinary cooking utensils. Any deficiencies in the cooking department are not owing to a lack of these appliances, but to the want of skill in the cooks themselves. For the small pay allowed to hospital cooks in the commissariat department it is impossible to secure the services of any with even moderate pretensions to the name. If they

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References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	can roast and boil tolerably well, and prepare simple puddings, they are considered to be perfectly qualified for the situation. No delicacy of any kind likely to tempt the capricious appetite of a sick man could be prepared by these miserable pretenders. 16. A complete set of hospital forms are forwarded with this report, but they are too long to be attached to the margin. 17. There is a hospital serjeant and sick orderly always attached to the hospital. The duty of the former is to assist in the steward's department, to see that all standing rules of the hospital are carried out, and to report all breaches of the same to the surgeon; to write out the daily report of sick, and generally to look after the hospital in subordination to the apothecary. He is not, however, in any sense a nurse or attendant on the sick. The sick orderly's duty is to go to each company every morning and evening, to collect the company sick reports, and bring up the men who require to be seen by the surgeon, both sick and convalescent; to march back those who are prescribed for without being admitted, and to take charge of the discharged men in the evening. The usual attendants on the sick in hospital are the ward coolies. In serious cases, when the comfort of better attendance seems to be required by the patient, it is usual, on the application of the medical officer to the captain of the company, for a comrade to be told off for this duty. In the serious illness of a woman the husband would be permitted to attend her. In ordinary cases there is an ayah and matranee for this purpose. The system of employing European nurses professionally trained might, I think, be most advantageously introduced into the hospitals in this country. 18. No epidemic has yet appeared in this hospital, nor any diseases which could in any way be attributable either to faulty position or other defective sanitary condition of the hospital. Both the men's hospital and that for women and children are excellently adapted for their purpose. 19. As a minor point I have already mentioned that more light might advantageously be admitted by substituting half glass doors for the wooden ones at present in use, and by having outside jhilmil doors; but, on the whole, nothing could be better than these hospitals. 20. There are no shaded walks for convalescents taking exercise, but there is a small garden attached to the hospital, and a good sized compound, in which the patients whose cases admit of it can take walking exercise morning and evening. When the weather is moderately cool they can sit outside in a covered verandah, which faces eastward, and which extends the entire length of the building. This also makes an uninterrupted promenade, and benches and easy chairs are placed for the convenience of the sick in different parts of the verandah. Elephants are usually available on the requisition of the medical officer for such men as he may consider likely to benefit by this mode of taking the air. 21. The sick wives and children of soldiers are treated in a separate hospital, as already mentioned, to which is attached a female establishment, consisting of an ayah and matranee. I consider the present arrangements very good and satisfactory. The women are very kind and attentive to each other in sickness. 22. A copy of the standing hospital regulations, which are affixed to the walls of each ward, is here enclosed. 23. In all matters appertaining to the sanitary condition of the hospital, to repairs, diet, and medical comforts, the medical officer may be said to have almost plenary powers. His suggestions, unless utterly unreasonable, would always be attended to. 24. There are no wards especially set apart for convalescents, and I do not think that much, if any, advantage would be gained by doing so. The convalescents are entered in the returns as "discharged from hospital." They go back to their barracks, do not attend drills or parades, and have to come up every morning under charge of the sick orderly to be inspected by the surgeon. They are not permitted to enter the canteen at all, nor to leave their barracks in the middle of the day, even in the cold weather, while encouraged to take morning and evening walking exercise.
XIII. BURIAL OF THE DEAD.	1. The burial ground used by British troops is about half a mile from the hospital, and between 500 and 600 yards from the nearest barrack. It is in a south-easterly direction from the station, the prevailing winds being W. and N.W. 2. The area is 1·06 acres, being 160 feet by 288. The subsoil is gravelly and porous, resting on clay, and the drainage is good. The ground is carefully kept. 3. There are no regulations about space, but practically the graves are at intervals of about two yards. The depth is generally six feet. None of the graves have yet been re-opened, only one body being interred in each grave. There is no compulsory regulation as to the time after death at which interment should take place, but if a death occurs before 11 A.M. in the hot weather the burial is usually the same evening; if after that hour the following morning. The only delay is on account of preparing the grave and providing a coffin. There are no native troops, or burial grounds for them, at the station. 4. The graveyard is never offensive in the slightest degree, and no particular precautions require to be adopted. On the death of a soldier the corpse is removed to a small detached building known as the deadhouse. As soon as a coffin can be prepared and the grave dug, burial takes place; if in the evening, half an hour before sunset, or in the morning at sunrise. 5. In regard to the dead of camp followers, or bazaar people, if Hindoos, they are burnt at a considerable distance from the station; if Mussulmen, they are buried in the Mussulman burial-ground, which is a good way out of the town. 6. I believe no injury to health accrues from the present practice. 7. I do not consider any alterations are called for.

(Signed) WALTER BRICK, Major, H.M. 6th Regiment Bengal European Infantry, commanding at Hazareebagh.
ED. MORTON, M.D., Surgeon H.M. 6th Regiment Bengal European Infantry.
J. DAWSON, Captain, Executive Engineer, Ramghur District, D.P.W.

Hazareebagh, 13th June 1860.

CAWNPORE.

Accommodation
- Queen's Troops
  - Battery of Artillery.
  - 1 regiment Light Cavalry.
  - 1 Infantry Regiment.
- Native Troops
  - Cavalry, Robarts' Horse.
  - Infantry, 43rd Light Infantry and Cawnpore Levy.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station has an arid aspect, with very few trees, except a tope here and there. It is flat and somewhat sandy and dry. There is no jungle whatever in the vicinity of the station, but on its eastern boundary there are many rows of trees and a large river, and a canal on the northern boundary. 2. The elevation of the station above the level of the sea is not known, and it is raised very little above the adjacent country, but there is a slight incline towards the river Ganges, above which its elevation is 60 or 70 feet, while it is raised above the canal on the north 15 feet. The country surrounding the station is a continuous flat. The infantry echellon barracks appear to be on rather low ground; however, everything is as yet unfinished, and the drainage imperfect. 3. There is no tableland or mountain nearer than the Himalayas. 4. The nearest waters are the river Ganges, which bounds the station on the east, the canal on the north, and the nullah on the south. The vicinity is not liable to overflow of water. There are many ravines near the station, but as no filth is allowed to be deposited there, they do not produce any appreciable effect on the health of the troops. 5. The station is open and freely exposed to winds, the echellon barracks particularly so. Many of the officers' quarters have gardens and trees, but nothing objectionable further than the compound walls being in some instances very high, and in some degree interfering with free ventilation. The temperature of the station is not raised to an extent worthy of notice by the buildings being exposed to reflected sun heat. Westerly winds generally prevail in the spring and hot months, and are considered healthy, though accompanied with much dust. 6. The surrounding country is cultivated in parts, but not in the immediate vicinity of cantonments; neither are there any works of irrigation anywhere near. Neither rice, indigo, hemp, nor flax are grown anywhere about the station. 7. There is a large native town to the north of the station, about a quarter of a mile from the canal boundary. 8. The soil of the station is marly, containing a good deal of sand, yet sufficiently stiff to prevent the rapid percolation of water. It extends to a very considerable depth, and is alluvial; while beds of kunkur (silica and lime) are found at a depth of 10 or 12 feet. There are no remains of former habitations. 9. To keep wells from drying up during the hot season they require to be about 70 feet deep. 10. The rainfall in the surrounding district is chiefly carried off by nullahs, which terminate in the Ganges. Some water remains many days on the surface, and is disposed of by percolation and evaporation. There is no drainage passing into the subsoil of the station from any adjacent higher ground. 11. The water supply of the station is derived from wells. There is a tank about 80 yards square, situated within the cantonment. I have never observed this tank to be dry, even in the hottest season. It is not used for any purpose that I can discover, and it is not liable to pollution from leaves or other matter falling into it. I have not been able to trace malaria as having arisen from it. 12. The supply of water available for the station is abundant, and there is no peculiarity of flavour or odour about it. I have not made any chemical analysis of the water, but judging from the soap test, I should say it contained very little earthy impurity. It is neither hard nor does it possess the quality of softness to any extent, and I consider it good, and the supply abundant. It is raised from wells in leather buckets and prepared skins, conveyed by the native water-carriers to the barracks, &c., and kept in earthenware vessels for use. 13. There are no more topographical points bearing on the health of the station not included in the foregoing queries. 14. New stations are selected by committees appointed by the Government, consisting of experienced military officers, an engineer, and one or two experienced medical officers if practicable, as members, with the view of examining the topography and climate, ascertaining the prevailing diseases, and the general healthy condition of the neighbouring population.
II. Climate.	1, 2. There are no means or instruments available at this station for conducting and registering meteorological observations, and the records of these for past years, if any existed, were all lost during the year of mutiny. 3. There are great fluctuations of temperature, humidity, and pressure at this station. There are no records of the density or otherwise of the atmosphere, or any means of ascertaining the electric tension of the air, or electric force of the different winds; or the presence or not of ozone. No bad effects can be attributed to irrigation. The air is impregnated with dust from April till the end of June. The temperature ranges extremely high during the hot winds, and some mortality usually occurs from heat apoplexy, sun-stroke, &c. The precautions necessary are to avoid exposure, excesses, &c., and that the drills should be restricted to the time between daybreak and sunrise and after sunset in summer. The clothing is varied according to the seasons, and well adapted to them. Evening drills might be advantageously dispensed with during the hot season, and all drills for infantry when the ground is wet, &c., during the rains. The most unhealthy months are from April to September, and the most prevalent diseases are fevers, cholera, dysentery, and rheumatism. 4. There is no district near this station the climate of which is more conducive to health than that of Cawnpore. 5. The following are the stations at which I have served, viz.:—Meerut, Sukkur, Umballa, Saugor, Sealkote, Jullundur, and Lucknow. Sukkur proved highly injurious to the troops, and great mortality arose from fevers of the remittent and intermittent types, and organic

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References to Subjects and Queries.	Replies.
II. Climate—*cont.*	affections arising from these. The station was situated on a limestone formation, elevated above the surrounding country, and perfectly bare of trees and vegetation. Some time in August the surrounding country, which had been inundated for two months by the overflowing of the Indus, became rapidly drained of the surface water by the falling of the river, leaving the soil impregnated with decomposed organic matter exposed to an intensely hot sun. Sickness and mortality soon commenced, and raged with great violence, particularly in H.M.'s 78th regiment, during the autumn of 1844. The station of Saugor is not a salubrious one. The geological nature of the soil, which is volcanic and ferruginous, occasions at certain seasons severe paludal fevers.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station and ground plan of the barracks, &c., are transmitted. 4. Table of barrack accommodation. Date of construction unknown, all records having been destroyed. Total number of rooms or huts — Echellon barracks - - - 10 ranges.; Foot Artillery do. - - - 2 „; Dragoon do. - - - 2 „ Total regulation number of non-commissioned officers and men — Echellon barracks - - - 1,000; Foot Artillery do. - - - 252; Dragoon do. - - - 150

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		ft.	ft. in.	ft.				ft. in.		ft. in.	ft. in.
Echellon barracks	100	168	24 6	30	123,480	1,235	41	1 6	28 56	8 0 2 6	4 6 4 6 (double storied barracks.)
Foot artillery do.	120	442	24 0	25	265,200	2,652	88	1 6	62 62	10 0 2 6	5 0 5 0
Dragoon do.	70	172	25 0	18	77,400	1,106	61	1 6	34	7 0	4 6
Do. married do.	as necessary	166	22 0	27	98,604	—	—	1 6	28	7 0	4 6
Guard room -	The No. of men on guard varies with the men occupying the same.	46	18 0	15	12,420	—	—	1 6	7	4 0	7 0
Prison cells -	12 cells -	10	8 0	12	960	960	80	1 6	1 1	3 6 3 6	6 6 2 0

In the above calculations the inner verandahs are taken as unoccupied, and the cubical contents of air therein omitted.

Several bungalows at the Cawnpore intrenched position are occupied by troops. Plans are transmitted herewith. Having originally been private residences, they are irregular in form and height, and cannot be brought under the classification of barracks. The allowance of air per man as at present occupied far exceeds the amount allowed per regulations.

5. The doors of the barracks are on opposite sides, and open inwards; and there are also inner and outer verandahs on both sides. The outer verandahs are not occupied, and the inner ones are supposed not to be; but of late years they have invariably been occupied, consequent on the influx of Europeans into the country. There are no jalousies or jhilmils.
6. The bedsteads used in the barracks are constructed of wood with twine bottoms, to which is added a tow mattress. I think iron bedsteads, with elastic iron bottoms, the best, and mattresses stuffed with cocoa-nut fibre.
7. The tents used in camps are of Government pattern and regulation area.
8. The ventilation is effected in barracks by doors and windows, and over-lights near the top of the walls, moveable on horizontal axes; and these means are quite sufficient for the purpose. The barracks are cooled during the hot winds by means of tatties, which are placed opposite the door openings in the western verandahs; these are supplied with water, and kept thoroughly wet during the whole of the day by an establishment provided by Government for the purpose. The apparatus is constructed of layers of the root of kuskus grass, fixed on a framework of split bamboo made to fit the doorways, and costs about 2½ or 3 rupees. The effect is a reduction of temperature to the extent of about 10 degrees or more.
9. The barracks, &c., are constructed of bricks and mortar plastered and whitewashed.
10. The floors are of stone flagging laid on rammed earth and broken bricks. They are raised on an average three feet above the ground; but there is no passage for air beneath them.
11. Can suggest no improvements in the materials and construction of the barracks, &c., which are kept in repair and their sanitary condition attended to by the brigadier, engineer barrack-master, and sanitary officer. The walls and ceilings are cleansed and limewashed annually, or at the request of the regimental surgeon.
12. Baths have not yet been constructed in the echellon barracks, but plans of the attached wash-houses are transmitted; and two plunge baths will be constructed in due course. Plans of the baths, male and female, attached to the foot artillery barracks are forwarded; baths and wash-houses are constructed near the barrack wells, from which water is brought by pipes, and similarly carried off to the nearest drain.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	13. The barrack cook-houses are rectangular buildings, in two parallel wards, about 30 × 12 each. Water is supplied by hand labour; and when used is thrown into sinks communicating, by open drains, with small cesspools immediately outside, and which are cleaned out daily. Europeans do not cook their own victuals nor wash their own linen in India.
	14. A sketch of the privies and urinals is forwarded; the urine passes by covered drains into cesspools, which are cleansed out every day; the ordure is removed by hand labour to the same receptacles, and conveyed daily to a distance from the station.
	15. The barracks are lighted at night by oil lamps.
	16. The barracks are drained by surface drainage; but the drainage of the echellon barracks cannot be perfectly carried out as long as the buildings are in progress. There are no sewers, and the drains are merely for carrying off the rainfall, all dirt, &c., being removed in carts daily. The drains when finished will be sufficient for the surface drainage; but they are not intended for draining cook-houses, privies, &c. The echellon barracks, being in an unfinished state, have been damp during the past rainy season, caused by leakage through the roof. The fluid refuse is all carried into cesspits, and removed to a distance from the station. These cesspits are near the outbuildings, viz., the cook-house and bath-house, &c.; they are chunamed, and do not admit of percolation. There are no foul ditches near the station, with the exception of one from the town of Cawnpore, near the cantonment boundary, and which is occasionally offensive when the water supply from the canal is deficient.
	17. The general surface cleansing of the cantonment and its vicinity is good. Persons are employed to remove all filth, &c., which may be found. The sweeping contractor removes the manure, &c., outside the cantonment boundaries.
	18. A little grass springs up on the surface of the cantonment during the wet season only. There are at present ruined bungalows and sepoy lines which interfere with the ventilation of the station, bazaar, &c., but they are in progress of removal.
	19. The drains in the bazaar are in good order generally; and its ventilation and water supply sufficient; the latrines also are kept clean. The regimental and artillery bazaars are crowded and in many parts ruinous. If these were levelled, and sites granted to the residents (except those actually attached to and required for the 54th regiment and artillery), it would add much to the sanitary improvement of this part of the cantonments, and promote ventilation and cleanliness. The regulations for preserving due cleanliness are good and improving. Every shopkeeper is required to keep the space in front of his premises clean; the litter accumulating there being regularly taken away every morning by the contractor for bazaar sweepings. The bazaar serjeant daily visits one or other of the bazaars, to see if they are kept clean; and any infringement of the regulations subjects either the shopkeeper or contractor to a fine for neglect, on their being reported by the serjeant. The generality of native houses in and near the station are built of mud and plastered over; a few only are built of bricks, with low-tiled roofs. No dungpits or cesspools are allowed; and if such be found they are filled up, and the owners are punished by fines. No nuisance is experienced in barracks from wind blowing over the native houses.
	20. The slaughter-house is in the commissariat yard, within the cantonment boundary, but a long distance from the barracks. The offal is carried away into the country; and no nuisance is experienced in barracks.
	21. There exists no particular arrangement for the picketing of horses and other cattle, which are generally kept near their owners' residence. One Arab merchant has been permitted to build a range of stables near the sudder bazaar; but this is the only one of the kind. Manure is regularly removed.
	22. There are no stables. Dung heaps are not allowed to remain any time; but the manure is sold, and conveyed some distance into the country. The picketing ground of the artillery is close to the barracks on the west side, which is objectionable; that for the cavalry is at least half a mile from the barracks occupied by the men, and at a greater distance from the building used as a hospital. The building occupied by the artillery sick is a quarter of a mile from their picketing ground, and is well situated as regards the prevailing winds.
	23. The few women now with Her Majesty's 54th regiment are well accommodated out of the barracks. In the artillery the women occupy part of the building temporarily used as a hospital. In the cavalry there are very few women; and these occupy the same barracks with the men, but have quarters at the extreme end of the building and are quite separate.
Officers' Quarters.	1. The officers' quarters at this station are healthy; but I think the height of many of the compound walls might be lowered with advantage.
IV. Health of the Troops.	1. From the appearance of the native population I do not think they suffer from the effects of malaria, and there is but little spleen disease amongst them.
	2. Cholera and small-pox occasionally prevail among the natives, aggravated by the crowded state of their dwellings, want of ventilation, &c.
	3. The inhabitants of Cawnpore are generally healthy, which may be attributed to a running stream of water, which flows from the canal through the town, and empties itself in the Ganges, by which means all filth and impurities are carried off.
	4. Her Majesty's 54th regiment, right wing, was stationed at Sultanpore from January to November 1859, during which time fevers were prevalent; but the general state of health was good. The left wing was at Fyzabad from February till October 1859; fevers were there prevalent, but general state of health good. The regiment was, on its arrival here in January 1860, healthy; since then fevers and venereal diseases have been prevalent. Her Majesty's 1st light cavalry arrived here from Allahabad in June 1859. Cholera, fevers, and bowel complaints prevailed during that year; but the regiment has continued healthy during 1860. No portion of the men's accommodation at this station is more unhealthy than the rest.
	5. The troops at this station are not camped out during any part of the year.
	6 to 13. No experience in hill stations; but I should think there is no period of residence in

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	them beyond which injury is likely to be inflicted on the health of troops on their return to service in the plains. 14. Troops serving in India should be located in hill stations, with short periods of service in the plains. However short, periods of change to the hills are decidedly beneficial to troops serving in the plains. Instead of sending troops to hill stations, a certain number of men should be selected from all the corps serving in India, so as to give every regiment a chance. Regiments contain many men who would be injured instead of benefited by a residence in the hills. Men of cavalry corps also would in this way derive the advantage of hill climate, which at present they are debarred from. For troops stationed in the plains, a change of station every three years is sufficient. 15, 16. No experience to enable me to reply to these queries. 17. There is no higher ground near this station which could be advantageously occupied as a hill station. 18. I have found volcanic, ferruginous, and limestone soils extremely insalubrious. 19. The best age for troops to be sent to India is from 21 to 25 years, and no soldier should be sent there until he has attained his full growth, and he should land there in November. I think troops preserve their health best when on the ordinary line of march, and would therefore move them up country in this way during the months of December, January, and February. Flannel belts should be provided for the men; and all recruits should be thoroughly drilled at home. 20. As far as I know, troops coming direct from the home depôts do not suffer more on their arrival in India than those sent from intermediate stations, such as the Cape, Mauritius, or New South Wales. I am not aware that a residence in hill stations would in any way accustom troops to the climate of the plains. Young soldiers suffer only from more acute forms of disease than those who have served in the country for two or three years or more. If troops newly arrived could be occupied and amused, &c., in barracks, and entirely prevented from exposing themselves to the habits generally of the soldier in India, and from indulging in spirituous drinks, sickness and mortality during the early years of service would be little as compared with those long resident in the country. 21. Troops are sent to the interior by steam-boats as far as Allahabad, or by bullock waggons; but I consider marching them up country preferable. 22. The British soldier should not serve in India more than from three to five years. I think a prolonged residence produces a morbid physical and intellectual change, and chronic disorders, necessitating the invaliding of a great number. If corps have a short service, viz., three years in India, their strength would be sustained for a much longer period, and their efficiency in other parts of the world not impaired. 23. The Presidency Board occasionally rejects men sent down as invalids by the Stationary Boards. 24. Invalids should leave India for home in February or March,
Diseases.	1. There are weekly inspections held at this station for the discovery of incipient diseases. 2. There have been no cases of scorbutus or scorbutic disease among the troops here. 3. There have been no cases of hepatic disease amongst the men of H.M.'s 1st European cavalry; but in H.M.'s 54th regiment the proportion of admissions for the last six months is as 35 to 1,009. The disease is attributable to intemperate eating and drinking, and is considered consequent on digestive derangements. No practical prophylactic measures can be suggested. 4. No case of dracunculus has occurred at this station. 5. Latterly, the proportion which venereal disease has borne to the total sick in hospital has been from one-third to one-half. Soldiers frequently visit other bazaars instead of confining themselves to their own regimental prostitutes, and in this way contract the disease. Lock hospitals would, I consider, be of little, if any, advantage. 6. The following are the diseases from which the troops at this station suffer, viz., intermittent and remittent fevers, dysentery, cholera, small-pox, and rheumatism. The following table shows the proportion which admissions and deaths from the above diseases bore to the total admissions and deaths in the year from April 1, 1859, to March 31, 1860.

In H.M.'s 1st European Cavalry.

Admissions from these Diseases.	Total Admissions.	Deaths from these Diseases.	Total Deaths.
	1,560	48	59
In H.M.'s 54th Regiment it is stated, viz.:—			
1 to	13	18 to	42

7. The nosological character of the more frequent zymotic diseases is miasmatic. They occur more frequently during the hot and rainy seasons, from April to September. No particular state of the atmosphere has here been observed to precede or accompany these diseases. I cannot say what particular habits and conditions of the troops and native population predispose to these diseases.
8. The prevalence of epidemic disease is influenced to a considerable degree by the soldiers' duties, habits, &c., but the precise extent cannot be specified.
9. Small doses of quinine have not been given as a prophylactic against malarial disease at this station.
10. I would suggest, towards the prevention and mitigation of epidemic disease at this station, more varied means of occupation and amusement.

References to Subjects and Queries.	Replies.
V. Intemperance.	1. The troops at this station are fairly temperate, and there are not many confirmed drunkards among them. 2. I am unable to give any information as to the proportion which admissions from diseases caused directly or indirectly by intemperance bear to the total admissions, and the medical officer of H.M.'s 54th regiment is likewise ignorant on this head. H.M.'s 1st European cavalry is a young regiment, and very few of the men have been 12 months in the service. Drunkenness is always punished as an offence. 3. Distilled spirits are sold in the canteens and bazaars. The bazaar liquor shops are under Government supervision, to prevent liquor being taken away and sold to European soldiers. Bazaar spirit is of various proof, and commissariat rum of the ordinary quality. The amount consumed per man per day is one-fortieth of a gallon at present, and whenever a full supply of malt liquor can be got the men have it. The soldiers at this station do not have spirit issued to them as part of the ration, either here, on the march, or in the field. It is always optional for a soldier to draw spirit up to his regulated allowance or not to have any. The practice of allowing a dram to be issued before morning parade has never been tried in H.M.'s 54th or the 1st Bengal cavalry. Colonel Herbert, C.B., of H.M.'s 54th regiment, has had experience of this practice in his late corps (H.M.'s 75th regiment), and found it answer very badly. Spirit is never given as a ration to convalescents. No drinks other than intoxicating drinks and injurious to health are sold at the canteens or bazaars. 4. The consumption of spirit by troops is neither conducive to their health nor to their efficiency and internal discipline. 5. If the sale of spirits could be abolished in both canteens and bazaars it would be highly beneficial to the health of the troops. 6. The use of malt liquor in preference to spirit ought to meet with every encouragement. 7. Neither coffee, tea, lemonade, nor ginger beer, &c., are used to any extent at this station. 8. Beer, tea, and coffee are far preferable to spirits, but if the sale of the latter were abolished in the canteen the men would be driven to the bazaar liquor shops, at least they would employ natives to procure liquor for them, and which they nearly always succeed in doing, notwithstanding the Government supervision. 9. It would be decidedly beneficial to the health of the troops to prohibit the sale of spirituous liquors in the canteens, provided there was a severe penalty inflicted on natives selling spirits to soldiers, otherwise it would be injurious. 10. No reply to this query. 11. The hours of issue at the canteens are ¼ to 1 o'clock, when 1 pint per man of malt liquor is sent to each troop or company for dinner, between 2 and 4 p.m. 1 pint is issued, and from ½ past 6 to ½ past 8 p.m. 1 dram of rum per man. The serjeant on duty at the canteen sees that these quantities are not exceeded, that no spirit is carried away, and that the canteen is regularly conducted, and shut at the proper hour. The bazaar liquor contractors are bound down in heavy penalties not to sell to the European soldiers or any one connected with them. Natives can obtain liquor, but cannot take any away without the magistrate's pass. Each liquor shop is furnished with a ticket in English, informing soldiers that the shopkeepers are not allowed to sell to them under any pretence whatever. There is only one shop in cantonments, but there are liquor shops in the sudder bazaar in the city not far from the cantonment boundary.
VI. Diet.	1. The ration for Queen's British troops and European troops in the Indian army is the same, and is composed as follows, viz.:—1 lb. bread, 1 lb. meat, 4 oz. rice, 2½ oz. sugar, ⅔ oz. tea, or 1⅓ oz. of coffee, 1 oz. salt, and 1 lb. vegetables. The only variety in this is the issue of mutton twice a week instead of beef, and in the vegetables. A responsible inspection of the ration is daily made by the subaltern officer of the day, quarter-master, and occasionally by the commanding officer, and a medical officer. 2. A complete ration is provided for the troops, and for which there is no stoppage. The men have three meals a day, viz.:—Breakfast at 7 a.m., consisting of tea and bread, and a portion of meat; dinner at 1 p.m., soup, meat, vegetables, and bread; and supper at 5 p.m., tea and bread. About one-third of the ration is composed of vegetables. 3. The ration is good, as at present provided for the men, and I cannot suggest any improvement in it. It is served out in messes, and could not be disposed of. 4. The cooking is fairly performed, and boilers, frying-pans, &c., are used. The cookhouses are kept clean, and sufficiently supplied with water. The cooking of the food is varied as the different messes may prefer, generally stewed with vegetable. It is well performed, as is also the making of tea and coffee. The men usually have coffee and a piece of bread before a march. 5. The establishment of gardens for the cultivation of vegetables would be very advantageous if so conducted that the whole work was performed by the soldiers themselves, with the exception of drawing the water for irrigation. If other native labourers were allowed, their chief value as a healthful employment and recreation for the European soldier would be destroyed.
VII. Dress, Accoutrements, and Duties.	1. The regulation dress according to the season is worn at this station; dyed cotton for summer, a cloth tunic for winter, and wicker helmets through the year. The accoutrements do not vary, and a forage cap is worn during the cold weather in the evenings, and always for night duties. I consider the present dress as suitable to the climate and for the soldiers' duties by day and night and at different seasons. Flannel belts, however, would be a great advantage to the troops, and should always be worn. Great coats are used on guard in cold and wet weather, and the sentries are protected from the sun and rain by sentry boxes, verandahs, &c.
Duties.	1. It is advisable that men be thoroughly drilled at home before being sent to India. 2. In the hot season a soldier's duties are light. He is on duty once a week, and on inlying picket once every 14 days. He has a morning parade at 5 o'clock, and generally a drill, varying from 20 minutes to an hour's duration. The evening parade at 6 p.m. is seldom more than a roll-call and inspection, except for awkward men, who have half an hour's drill. Cavalry regiments are subjected to severe drill in the riding school: they should be thoroughly

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References to Subjects and Queries.	Replies.
VII. Dress, Acoutrements, and Duties—*cont.*	drilled at home. The best hours for drills, parades, and marches depend on the season. The average number of nights which the men have in bed during the week is 7 (i.e., on guard not quite once). At the intrenchment the duty comes round a little more frequently, the men having six nights in bed. 3. Guards are mounted in the immediate vicinity of the barracks. They last 24 hours, but a portion of the men on the larger guards are sent to their barracks during the day, mounting again at sunset. The roll-calls are as follows: for breakfast at 7 a.m., one at 11 a.m., 1 p.m., 5 p.m., 6 p.m., and tattoo at 9 p.m. Additional precautions for night guards are not thought necessary.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of recreation and instruction provided for troops at this station, viz., a ball-court, skittle-grounds, regimental schools, libraries, reading rooms, workshops for tailors, shoemakers, and armourers. Cricket is a favourite amusement, and the theatre is occasionally used, but its distance from the barracks is inconvenient. Putting shot and quoits are practised, but there is no regular gymnasium. Men fond of reading may be amused during the daytime; but ball-courts, skittle-grounds, &c., are not the kind of occupations for soldiers during the heat of the day, and as they are at present constructed, The men are not allowed to expose themselves from 7 a.m. till 5½ p.m.; at least there is an order to that effect, but it is often disobeyed. 2. I would have skittle-grounds in a properly constructed building, with doors, and have tatties supplied during the hot winds, also gymnasia, shooting galleries, and swimming baths on a similar plan, so that those who cannot read or amuse themselves in the libraries, schools, or workshops might find other occupation. 3. The regimental savings' bank of H.M.'s 54th regiment is in full operation, about one-third of the men being depositors, some to a large amount. It has the best result. 4. There are no means whatever, except the barrack verandahs, to enable the men to take exercise during the heat of the day without injury to health.
XI. MILITARY PRISONS.	1. The military prison is not sufficiently raised, the roof is far too low, and the temperature, in consequence, extremely high. Ventilation is now perfect enough, as the high mud wall which formerly surrounded the building has been removed. Most prisoners fall sick after a short sojourn there in the hot months, owing to the heat, glare, and hot winds and dust blowing through them.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the General Presidency Regulations. 2. Medical officers can only make suggestions as to the line of march, camping, &c., which may or may not be attended to. They have no powers. 3. Camping grounds are selected by the quartermaster-general of the force, with reference to good ground, water supply, &c. There is nothing to complain of in respect to ventilation in camp. Excavations are made in certain positions to be used as privies, and are afterwards filled up with earth. The general surface cleansing is performed by the quartermaster's establishment of corps. The principal medical officer may recommend any sanitary arrangement he deems requisite. 4. Information respecting the arrangements adopted in the presidency for field hospitals, ambulances, hospital supplies, &c., can be more conveniently afforded from the office of the principal inspector-general.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information is afforded under this head.
XII. HOSPITALS.	1. The only hospital here is the artillery one, occupied by Her Majesty's 54th regiment, a plan of which is transmitted. 2. It is well away from the native buildings or bazaar. The site is a good one, being open, and nothing to interfere with the free ventilation. 3. The water supply is abundant and good. 4. Surface drainage removes the refuse water from the hospital, and all impurities, &c., are conveyed to a distance in the country every day. 5. The floors are of stone, and raised 3½ or 4 feet above the ground, but no current of air passes beneath it. The roof covering consists of six inches of thatch overlaid with tiles. The drainage arrangements which are merely surface, seem sufficient for carrying away the roof and rain fall rapidly. There are verandahs on both the inner and outer sides of the hospital, *vide* plan. The inner ones are made use of when necessary for the accommodation of sick, &c. The hospital consists of one flat.

TABLE of HOSPITAL ACCOMMODATION.

Total number of wards - - - - - - - - 3
Total regulation number of beds - - - - - - 72

Wards or Hospital Huts.	Regulation No. of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
No.		ft.	ft.	ft.	ft.			ft. in.		ft.	ft.
3	24	87	24	27	56,376	2,349	87	1 6	12	8	5 per ward.

If the inner verandahs be occupied the number of beds is doubled, or the hospital becomes suited for 144 beds. In the above calculation the cubic contents of the air in either verandah has not been taken into consideration. The hospital is so placed as to receive the full benefit of the prevailing winds.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	6. The ventilation of the hospital is effected by doors, and pipes carried through the thatch. These means are found sufficient. There are no jalousies or jhilmils. 7, 8. The means used for cooling the air admitted into the wards are the same as those used in the barracks. There is no apparatus for warming it. The walls and ceilings of the wards are cleaned and limewashed every six months, or whenever the medical officer may deem it necessary. 9. The privies, urinals, &c. are about 40 yards to the rear flank of both ends of the hospital, and are square rooms 40 feet by 20, and are 10 feet high. Round one side there are a number of small walls, 1½ feet high, and distant about a foot from each other, immediately in front of which is a shallow drain for the receipt of ordure, &c. They are not over cess-pits, and are offensive, as they are not properly drained, but are about to be improved. 10, 11. There is a small plunge bath, with a narrow edging, on which are vessels for washing, &c. These means are neither sufficient nor convenient. 12. The linen is washed and dried by the native washermen at a distance from the station. 13. The storage is sufficient and dry. 14. Some of the bedsteads used in hospital are of iron and some of wood, with twine or tape bottoms. Iron cots are the regulation ones, with elastic iron bottoms, and are well adapted for the purpose. The mattress is of red cloth, stuffed with tow, but cocoa-nut fibre would be best. 15. The hospital kitchen is a square building, about 40 feet by 20 feet, with apparatus. The cooking is tolerably well performed. 16. Copies of the diet tables, diet rolls, &c. can be best supplied from the office of the principal inspector-general. 17. There are a hospital serjeant and orderlies, at the discretion of the medical officer, for attendance on the sick, also ward coolies, and these are sufficient for the purpose. 18. The sanitary condition of the hospital is tolerably good. No epidemic has appeared in it. 19. The construction of the hospital privies might be improved, which, I believe, is about to take place. 20. Convalescents can walk about the hospital compound, and elephants and spring bullock carts are also provided for them, but there are no shady walks. 21. The soldiers' sick wives and children are at present accommodated in their barracks, but a hospital will soon be appointed for them, which will be a great advantage. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations. 23. The medical officer has an absolute power as regards change of diet, &c., but with respect to the sanitary state, repairs, &c., he must make a requisition on the proper department, and which is usually attended to if practicable. 24. There is no convalescent ward, or hospital for convalescents, provided at this station. I think accommodation of this sort would be highly advantageous.
XIII. Burial of the Dead.	1, 2. The graveyard for British troops is within the cantonment, and about half a mile from the echellon barracks. It lies in a westerly direction, and the prevailing wind is westerly. Its area is about seven acres, with a surface and subsoil of marl. There is a shallow ditch outside the mud wall of the graveyard. As the graves are not re-opened, I am unable to say whether decomposition is rapid or not. There is no care bestowed on the ground, further than having a chowkeydar to keep out trespassers and animals, no funds being available. 3. Graves, which are never re-opened, are about 6 feet in depth, and have an interval between them of about 3 feet. The time of interment after death varies from 10 to 24 house, according to the time of year. The hot season, rather than the prevalence of epidemics, regulates the time of interment. The majority of natives, being Hindoo, have no graveyard, but the dead bodies are burnt. Mohammedans are buried, but not within the cantonment. 4. The graveyard is never offensive. British troops are buried at sunrise and sunset, but there is nothing peculiar in their mode of burying. 5, 6, 7. The dead of camp followers and bazaar people are either burnt, buried, or thrown into the Ganges. No injury accrues to the public health from the present practice, nor is any improvement to be suggested.

(Signed) M. K. Atherley, Brigadier,
Commanding Cawnpore.
David Simond, Captain, Bengal Engineers,
Ex. Engineer, Cawnpore Division, N.W.
John Campbell, M.D., Surgeon,
1st Bengal Light Cavalry.

20th October 1860.

CHUNAR.

Accommodation—Queen's Troops { Artillery - - 148
Infantry - - 120

References to Subjects and Queries.	Replies.
I. Topography.	1. The station of Chunar is situated on the right bank of the Ganges. The aspect of the country is open on the river side, but on the land side it is undulating, hilly, sandy, and dry, except in the rainy season, when it is swampy, and more or less under water,

CHUNAR. BENGAL.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	from the overflow of the Ganges. There is not much wood, and no jungle in the vicinity; water, however, is abundant.
	2. The elevation of the station above the sea is taken at 250 feet. It is rather below the elevation of the general level of the adjacent country. The river Ganges is immediately on the right or north side, and the Jurghoo Nuddee is within a quarter of a mile to the south. There is higher ground than that on which the station is situated by 20 or 30 feet; but there is no reason to infer that it is healthier. The cantonment formerly occupied ground on the south of the Jurghoo, and to the west of the fort, but for military purposes it was removed to its present site.
	3. The nearest table land is about 1½ miles distant from the station, and is about 200 feet above its level.
	4. With regard to the nearest water, the station and town of Chunar, which are closely approximated, occupy a delta not exceeding half a mile in the greatest width between the Ganges and the Jurghoo Nuddee. The Ganges overflows its banks annually in the rainy season, and generally in the month of August. The overflow does not last above a fortnight. There is some broken ground and many ravines, caused by the water-courses from the hill streams; but I have not found that they affect the health, as the water drains rapidly into the Jurghoo.
	5. The fort in which the troops are mostly located, from its great elevation is freely exposed to winds. The rest of the station is open only to winds from the river side; the fort and the buildings in the town interfere with free ventilation on the other sides. The temperature of the station is raised in very hot weather, by the buildings being exposed to reflected sun heat. The station is very little exposed to cold or variable winds, or to land winds except in the fort; it is, however, exposed to the river breeze, which is pleasant and generally healthy; but sometimes induces colds and fevers at the termination of the rainy season.
	6. The surrounding country is generally highly cultivated, except where the sandstone hills of the Vindyan range approach closely the south of the station. Near their base the soil is of a kunkury nature and unproductive. There are no works of irrigation in the vicinity. Irrigation from wells is carried on to a small extent,—it has no effect on the health of the station. The soil near the river bank is overflowed by the Ganges in high rains, and at all times is tolerably moist. No rice is grown within several miles of Chunar, as the nature of the country is not suited to its production. Indigo is cultivated to a small extent, but not in the immediate vicinity of the station; no hemp or flax is prepared. No nuisance or injury to health results from the partial cultivation of indigo.
	7. The town or city of Chunar with a population of 14,000 is in immediate proximity with the station.
	8. The sandstone hills of the Vindyan range approach the Ganges at Chunar, and a detached offshoot from them forms the site of the fort of Chunar, which overhangs the river. The sandstone is of the nature called "new red." Near the base of the hills the ground is undulating, and contains much limestone kunkur. The subsoil is mostly Gangetic deposit, composed of different kinds of clay and sand. The station has been built on the verge of a suburb of the city; part of it was formerly occupied, but the greater part has been built on new ground.
	9. Water is found at a depth of between 40 and 45 feet in the dry season, and of between 25 and 30 feet in the wet.
	10. The rain-fall drains readily from the surface. There are no surface springs or subsoil drainage, and generally very little water anywhere, except in a high flood of the Ganges, when a great part of the station and of the suburbs of the town is under water. There is no adjacent higher ground from which the drainage could pass into the station.
	11. The water-supply of the station is derived from the Ganges and from wells. There is no tank in the station nor within half a mile of it. Care is taken to prevent leaves or other matter falling into the wells. There is no nuisance experienced from the wells.
	12. The water-supply available for the station is inexhaustible. If allowed to settle before it is drank, it becomes clear, sweet, and inodorous. Its chemical composition has not been ascertained, but it is probably similar to that at the neighbouring river stations. It is soft, and examined by the microscope nothing is seen but dust, consisting of minute fragments of vegetable matter, and a few feathers of insects. The quality of the water is good and wholesome. The water is filled from the Ganges into puckals and mussaks, and conveyed by bullocks and bheesties to the barracks. From the wells it is raised in ghurras by hand pulleys, and filled into mussaks; no better water is procurable.
	13. The row of huts westward of the thatched barracks, as well as most of those on the river front of the barrack square, should be levelled, as they materially interfere with the ventilation. The road between the barrack square and the church is narrow, and shut in on the south by huts, which should be thrown back and the road widened to admit of a free current of air into the square.
	14. New stations are selected by a mixed committee of military, medical, and civil officers. The Engineer Officer attached to the division, if not a member of the committee, is directed to be in attendance. The committee are furnished by the Quarter-master-General's office with a printed copy of Dr. Dempster's rules for the selection of sites for cantonments. I cannot suggest any improvement in the manner of selection.
II. CLIMATE.	1. An ordinary thermometer and a common tin rain-gauge made by a native workman are the only meteorological instruments at this station.

2. TABLE of Meteorological Observations from 1st January 1850 to 31st December 1859.

Months.	Barometer. Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Sun Temperature.	Rain, inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January	—	65	22	76	54	84	·5	S.W.	Moderate	27	A few fleecy clouds, heavy dew, winds cold, no storms.
February	—	69·5	25	82	57	90	1·5	S.W.	Calm	25	Dark clouds for a few days about the middle of the month, dew not so heavy as in January, wind rather cold.
March	—	78	30	93	63	100	·75	S.W.	Calm	28	A few light fleecy clouds, very little dew, wind pleasant.
April	—	86	24	98	74	106	·5	S.W.	Moderate	27	A few light fleecy clouds, no dew, wind warm at mid-day, no storms.
May	—	91	22	102	80	113	·5	S.W.	High Winds.	26	A few light fleecy clouds, wind hot, no dew.
June	—	92	22	103	81	120	10	N.W.	High, with occasional storms.	15	Clear the first half, cloudy with storms and lightning, wind hot to 15th, no dew, rain, and occasional storms.
July	—	87·5	17·5	96	79	110	14	N.W.	Do.	6	Dark heavy clouds, wind cool, no dew, occasional storms.
August	—	86	16	94	78	107	12	N.W.	High, with occasional gales.	8	Dark heavy clouds, no dew, wind cool, occasional gales, but no storms.
September	—	85	16	93	77	100	6	N.E.	Moderate	13	Dark clouds from 1st to 15th, no dew, wind cool and pleasant.
October	—	81·5	19	91	72	95	2·5	N.E.	Moderate	22	A few light clouds, dew falls about the 15th, wind cool.
November	—	73·5	23	85	62	90	·5	N.E.	Moderate	27	A few light clouds, heavy dew, wind cold from 15th to 30th, no storms.
December	—	65	24	77	53	85	1·25	S.W.	Calm	26	Occasional dark clouds about the end of the month, heavy dew, wind cold, no storms.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. The general character of the climate is hot and healthy; very hot and dry during the season of the hot winds; hot and moist in the rainy season; pleasantly cold in the cold season; the variability of temperature not excessive at any period; very little subjected to fogs, and generally free from dust and other admixtures affecting the atmosphere. Acclimated soldiers of temperate habits preserve their health in Chunar. Good diet, shelter, and clothing, varied according to the season, are required. There are no drills or exercises, the only duty devolving on the soldiers being guard mounting. The day sentries are necessarily protected as much as possible against the sun's rays. The night sentries in the cold weather are provided with great coats. Generally the months of October, November, and half of December are the most unhealthy from the prevalence of intermittent fever. In some years the hot weather sets in with an accession of fever and cholera, but generally the season of the hot winds is the healthiest part of the year.
	4. There is very little, if any, difference in the climate of Chunar and in that of the neighbouring district. The fort of Chunar, from its elevation and favourable position, is perhaps healthier than any place in the vicinity. The station though less favourably situated, is generally healthy, and with reference to the fort one more convenient could not be selected.
	5. The stations at which I have served are as follow: Fort William, Barrackpore, Purtaleghur, Bancoorah, Dinapore, Kyouk-Phyoo, Nursingpore, Benares, Allahabad, Burripore, Merut, Ferozepore, Kurtarpore, and Chunar. I served principally with native troops, having occasional charge of a civil station and European artillery. I found Purtaleghur and Kurtarpore the healthiest; next to them Merut and Ferozepore. Kyouk-Phyoo alone I considered injurious to health. The health of the troops at the other stations was generally good.
III. SANITARY CONDITION OF STATION.	1, 2, 3. No map of the station exists; plans of the station and barracks, &c. are forwarded.
	4. TABLE of Barrack Accommodation.
	Date of construction of barracks at Chunar is unknown. No. 1 was first occupied as a barrack in 1840–1; No. 2 was converted into a temporary barrack in 1857; No. 3

CHUNAR. BENGAL.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	was built for the subordinate officers of the arsenal and magazine, and afterwards made over as a barrack; No. 4 was constructed probably in 1814, when the hospital was purchased.

Total number of rooms or huts, 25.

Total regulation number of non-commissioned officers and men, 268.

Barrack Rooms for Huts.	Regulation Number of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
		Feet.	Feet.	Feet.				Ft. In.		Ft. In.	Ft. In.
In Fort.											
No. 1. House Barrack, 7 rooms:	68	1 19½	15	21	6,142	1,305	62	1 6		None.	
		1 24½	15	21	7,717			1 6			
		2 21	15¾	21	13,892			1 6			
		3 44	22	21	60,984			1 6			
No. 2. Gunshed (temporary, condemned.)	60	170	34	12	69,360	1,156	58	1 6	16	5 4	3 3
No 3. Veteran Barracks (condemned), 14 Rooms.	60	4 14¾	15½	13	11,888	1,278	43	1 6	36	5 0	3 4
		1 14	15½	13	2,821			1 6			
		1 13	15½	13	2,619			1 6			
		1 15½	15½	13	3,072			1 6			
		1 15½	15½	13	3,121			1 6			
		2 17	15½	13	6,850			1 6			
		1 19	15½	13	3,828			1 6			
		1 46	16½	13	9,867			1 6			
		1 79	15½	13	15,918			1 6			
		1 83	15½	13	16,724			1 6			
In Lower Lines.											
No. 4. Thatched Barrack, 3 Rooms	80	1 258	21½	16¾	92,912	1,224	76	1 6	24	5 6	4 0
		2 14	21½	16¾	5,041			1 6			
TOTAL	268	—	—	—	—	—	—	—	—	—	—
Guard Room, Fort	11	37½	37½	19	14,062	1,278	128	1 6	3	4	3
Do. Lower Lines	4	24	16	11¼	4,320	1,080	96	1 6	4	4½	3½
Prison Cells, 4 Rooms	1	11½	6	11½	—	—	—	—	—	—	—
	1	11	7½	11½	3,829	957	77	—	—	—	—

5. The windows of the barracks are on opposite sides and open inwards. The house barrack has a 10 ft. verandah east and west. The gun shed barrack has a 13 ft. verandah to the west; the veteran barrack, a verandah 11 ft. wide all round; and the thatched barrack, a 9 ft. verandah all round. The verandahs are commonly occupied as sleeping quarters by the soldiers in the hot season. There are properly constructed jhilmils.

6. The cots are made of wood and string. The bedding consists of a thick cotton quilt, a blanket, sheet, and sitringee. I think the cane-bottomed cots, such as are in use in the hospital here, preferable to the stringed cots, being stronger, more easily kept free from insects, and better for sitting on.

7. Tents are made of layers of country cloth, strengthened with tape and bamboos. They have double flies, two poles 10 ft. high, and 6 ft. kanats, with four openings for doorways, 4 ft. wide. The dimensions are 21 × 16, which gives 168 ft. of cubic space per man, and 21 ft. superficial area. They are made to hold 16 men. Any amount of air can be obtained by bracing the kanats to the fly ropes, which is commonly done in the hot weather.

8. In barracks and guard rooms the ventilation is effected by means of doors, windows, and openings in the roof, and in the tents by openings in the kanats and the open space between the flies. Larger roof openings are required to keep the air pure at all seasons, should the barracks be fully occupied. The means used for cooling the air in barrack rooms are punkahs in the hot weather and rains, and kus-kus tatties in the season of the hot winds. The punkahs are fixtures; the tatties require to be renewed every year; their cost is about 3 rupees each.

9. The barracks here are constructed of stone and mortar. The tents are made of country cloth (dosub), tape, and bamboos, as before mentioned.

10. The floors are terraced, except in the gun-shed barracks, the floor of which is paved. In the house barrack the floor is 3 ft. 3 in. above the ground; in the gun-shed barrack, 1 ft. 6 in.; in the veteran barrack, 1 ft. 6 in.; and in the thatched barrack it is 1 ft. 5 in. above the ground. There is no passage for air beneath.

11. The materials are good, but the construction of the three barracks in the fort is faulty, as may be seen by reference to the ground plans. Barracks, whether of a single or double story, should be built on the plan of the thatched barrack, and in a position freely open to the wind (which, however, that barrack is not). The barracks are kept in repair by the Barrack Master of Benares and the executive Engineer of the division, who have subordinates on duty at the station. Generally, repairs are promptly attended to. The senior Medical Officer is ex-officio the sanitary officer;

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Stations—*cont.*	but he is only responsible for bringing sanitary matters to the notice of the superior authorities; he has no executive power. The walls and ceilings of the barracks are cleansed and lime-washed once a year. 12. There is a washing place for each barrack, except the veteran barrack. The water is procured by the same means as the drinking water, and runs out through the wall into the drains. There are no baths, but the soldiers have the advantage of bathing in the Ganges, which runs round the northern side of the fort. 13. The cook-houses are provided with the common clay fire-places used by the native cooks. The water is supplied by the bheesties. The refuse water drains off through an outlet in the wall. The washing and drying are done by the dhobies. The station being so near the river, there is every convenience for the purpose. 14. The privies are provided with a range of open seats, and a guttering for the urine. In the fort, the contents are carried off by hand by the mehteers, and in the lower lines are drained into a cesspool. 15. The means used to ventilate these buildings are windows, doors, and roof openings; The barracks are lighted by lamps at night. 16. There is no sewerage. The drains are open from 9 to 18 inches wide, and the same in depth: where the ground admits they are close to the verandahs. In the fort, owing to the inequality of the ground, they are from 8 to 18 feet distant. The fort standing so high above the Ganges, the natural drainage is good. The drainage of all the buildings is sufficient. There is no part of any building used as a barrack or hospital which is damp. There are two cesspools in the lower lines, into which the contents of the thatched barrack and hospital privies are drained. The cesspools are to the north of the barrack and hospital. The barrack cesspool is 4 ft. deep and 4 ft. wide, and 200 yards distant from the nearest well; that for the hospital is 3 ft. wide and 3 ft. deep, and 80 yards from the nearest well, but not in a line with it. The barrack cesspool is 68 yards distant from the thatched barrack; the other is 30 yards from the hospital on the outer side of the wall. The contents are taken away in casks night and morning. There are no foul ditches at this station or near it. 17. The surface of the cantonment, which is small, and contains no native bazaar, is generally clean. The banks of the Ganges and Jurghoo, in the vicinity of the city, are frequented by natives, and are dirty. There is a small establishment of mehteers employed to remove the filth from the city. At present the surface cleansing is not effectual; but more efficient arrangements are about to be made by the civil authorities. 18. The surface of the cantonment is kept free from all vegetation. There are some unroofed huts on the road between the lower barracks and the church, which I have reported as interfering with the ventilation, and have recommended their being demolished. 19. There is no bazaar within the cantonments. The bazaar in the city is entirely under the management of the civil authorities, and is kept clean, and in good order. The natives are compelled to keep the road in front of their houses clean, and are forbid to commit any nuisance in the vicinity. Mehteers are employed to sweep the streets, and carry off any filth. The bazaar always appears clean. I have no suggestions to offer. Many of the native houses are in a ruinous condition, and some of them I have recommended to be pulled down to improve the ventilation. There are some cesspits and privies, the contents of which are carried to a distance by the mehteers. When there is an overflow of the Ganges and Jhurgoo, the natives are driven to commit nuisances near their huts. The only remedy I can propose is to knock down the greater part of the huts between the church and lower barracks, and forbid their being rebuilt. 20. The slaughter-house compound is a quarter of a mile from the station. The place is under the superintendence of the commissariat serjeant, and kept in very good order. The offal is disposed of on the banks of the Jhurgoo, and is immediately devoured by birds and pariah dogs. The condition of the slaughter-house and arrangements are satisfactory. 21. There are no horses in the station, except those kept by officers and civilians in their own stables. 22. There are no artillery or cavalry stables, nor any picketing grounds at this station. 23. There are separate quarters for 13 married men in the veteran barrack, and for two in the thatched barrack. The accommodation is insufficient. Many married men occupy barrack rooms, and some few have permission to live in houses in the barrack square, for which they pay rent.
Officers' Quarters.	1. There are no quarters for officers at this station.
IV. Health of the Troops.	1. The district adjoining the station and the native population are generally healthy. 2. Among the native population intermittent fevers, small-pox, and cholera prevail in the hot weather, and diarrhœa and intermittent fever on the breaking up of the rains. Enlargement of the spleen is common. 3. The general healthiness of the native population may be attributed to the goodness of the water, the general equality of temperature, and the protection afforded by the neighbouring hills from variable winds. 4. The troops at this station are composed of men from every station in this Presidency where European troops of H. M. Indian army, artillery, infantry, and cavalry, are stationed. Wounded men and men broken down by disease, and considered unfit for field service, are invalided into this battalion. The invaliding committee are assembled on the 1st September, and the men mostly arrive here in December and January. The diseases to which new comers are mostly liable are bilious attacks, with more or less fever. The accommodation of the men in the veteran barrack and gunshed barrack is more unhealthy than the rest, from the bad style of building, low roof, and imperfect ventilation. 5. The troops at this station have never been encamped, they were sent here as fit for garrison duty only. 6 to 10. No experience of hill stations; but approve of them for troops. The disease most to be dreaded in the hills is diarrhœa. Flannel should always be worn, and a flannel belt round the belly by those who are disposed to bowel affections. The diet should be good, and free exercise in the open air taken at all times.

CHUNAR. BENGAL.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	11, 12. The season of the hot winds from April to June, and that from the commencement of the rains in September to December are the best adapted for residence in hill stations. In November the climate is very fine. The shortest period for troops to benefit by such residence is six months. In general I should say that a prolonged residence is conducive to health. Most persons on their return to the plains are subjected to a bilious attack, caused by the change of climate and temperature. 13. Troops if possible should not be allowed to leave the hills before November, and on approaching the plains they should be forbidden to expose themselves unnecessarily to the sun. 14. In order to preserve the health of troops serving in India, I think it would be better, if possible, to keep them on the hills for eight months of the year, and allow them to pass the other four months on the plains. Some stations in the plains being more healthy than others, it follows that a frequent change of stations in the plains may not always be beneficial, except to convalescents, whose health is generally improved by change of air and scene. I think it would conduce, however, to the health of the troops if they were encamped for two months in the cold weather and marched about the district. 15, 16. No experience of hill stations. 17. Not aware of any higher ground near the station which could be advantageously occupied as a hill station. 18. I think the dry gravelly soil the most healthy for stations; but any surface or soil will generally be healthy if the natural drainage is good. 19. Soldiers should not proceed to India under 20 years of age. The best period to land there is in the cold weather months of November, December, and January. I cannot speak positively as to the mode in which troops are disposed of on first landing, as I have not been on duty at the Presidency since 1841, but to preserve their health, they should be sent up the country as quickly as possible. Hazareebaugh I think would make a good depôt for troops newly arrived. 20. Troops for India should be sent direct from the home depôts. Every atom of their strength and energy is required to enable them to stand the debilitating climate of India. They should be sent to a hill district if possible, but certainly as far as Hazareebaugh. 21. Troops are at present sent by railroad to Raneegunge, and from thence by bullock train to Allahabad, where the railroad is again available; they are also sent up in steamers. Troops coming up by land generally arrive in good health. Great care should be taken not to overcrowd the steamers, and when it is possible the men should be allowed to go on shore of an evening for exercise. 22. The number of years a British soldier should serve in India depends on his constitution and habits. A man moderate in his habits may serve for 15 years if he has the benefit of a change to the hills once in four or five years. 23. With regard to the powers of Medical Officers in reference to invaliding, the medical committee at the Presidency have the power of nullifying the award of the station committees, and not unfrequently exercise it by remanding a man to his duty. I doubt whether the Presidency committee should have this power, as the man thus sent back almost invariably becomes a hospital skulker and an incumbrance on his regiment. 24. Invalids should leave India for home in the months of January and February.
Diseases.	1. There are no regular inspection parades for the discovery of incipient diseases at this station, nor has such been the custom in the invalid battalion; every man observed to be ill is immediately sent to hospital by the non-commissioned officer on duty at the barracks. 2. There has been no scorbutus amongst the troops at this station. 3. The average proportion of hepatic disease of the last five years is as 1 to 31. The causes are intemperance and exposure to the sun, the disease occurring in men who had previously suffered from it, and had been invalided in consequence. The most effectual prophylactic measure is to discountenance, as much as possible, the use of spirituous liquors. 4. I have not had a single case of dracunculus in hospital. 5. The proportion which venereal diseases bear to the total sick in hospital from all other diseases, taken from the returns of the last five years, is as 1 to 31. The soldiers at this station are singularly free from venereal disease, owing probably to the greater number of married men in the battalion with families and female servants in attendance on them. I think that a small inexpensive establishment, consisting of an experienced native doctor and two or three women, dhyes, should be attached to every bazaar where European troops are stationed, and a house taken in the bazaar, and proper medicine supplied, the whole being under the superintendence of the sanitary officer and cantonment magistrate. The prostitutes, who are a distinct class in India, and do not disguise their vocation, should be registered and numbered. An establishment of this kind would be more suitable to the native ideas and feelings than a regular lock hospital, and I think would prove more effectual in reducing the amount of disease. 6. The troops occasionally suffer from epidemic and endemic diseases of the following class:— *Fevers.*—Intermittent fever in all its forms, but mostly from quotidian and tertian. *Dysentery.*—There has been no case of this disease. *Cholera.*—Occasionally there is a visitation of cholera. *Small-pox.*—There has been no case of this disease. *Rheumatism.*—There have been only a few cases among the older men. The proportion which admissions and deaths from these diseases bear to the total admissions and deaths, are taken from an average of the returns for the last 10 years.

Diseases.	To Admissions.	To Deaths.
Fevers	1 in 4·67	1 in 15·45
Dysentery	1 in 53·05	1 in 15·45
Cholera	1 in 47·91	1 in 4·41
Small-pox	None.	None.
Rheumatism	1 in 25·61	None.

References to Subjects and Queries.	Replies.
. Health of the Troops —*Diseases—cont.*	7. The most frequent zymotic diseases are intermittent fevers and cholera. Intermittent fevers, in addition to the usual symptoms, are often attended with much gastric irritability, which continues sometimes for two or three days, with very little remission. Cholera is seen in all its varieties, but with no symptoms to distinguish it from the cholera of other places, the pulseless and spasmodic form being the most frequent and the most fatal. The fevers, with ague and gastric irritability, are prevalent at the setting in of the cold season. Cholera more frequently prevails in the hot weather. In the months of October, November, and the early part of December, when the sun is still very hot, and the nights and mornings are raw and chilly, fevers prevail. Cholera is more to be dreaded when the heat is excessive, the atmosphere heavy and oppressive, with little or no winds, and those from the south and south-east. The same attention is paid to the sanitary arrangements of the town and station at all seasons. When cholera appears the greatest anxiety is shown by the authorities to remove every possible cause for its further progress. Intemperance, which leads to undue exposure, and the debility caused by the state of collapse which follows the indulgence, predispose the troops to these diseases. Among the natives want of sufficient good food and clothing are the most frequent predisposing causes. 8. The prevalence of epidemic disease is also influenced by exposure to the raw chilly air which prevails at night, at the setting in of the cold weather, when on sentry duty; and by undue exposure to the sun and night air when under the influence of liquor. 9. Quinine has not been tried at this station as a prophylactic against malarial disease. I am averse to giving it until the state of the liver and *primæ viæ* have been attended to. It is given to convalescents to prevent a return of fever, but I find that chyretta answers nearly as well. 10. Epidemic diseases are not of common occurrence at this station; and, cholera excepted, the visitations are not remarkable for their severity, and cause no apprehension. They prevail at particular seasons, and are caused by the natural vicissitudes of the climate and atmosphere. Sober, well-conducted men, are less frequently attacked than men of irregular habits. Except guard duty, the soldiers have no military duty, and the means of amusement are very scanty. The want of employment leads to intemperance and consequent disease. More work and more amusement are the best prophylactic means for the prevention and mitigation of disease.
V. Intemperance.	1. The greater portion of the soldiers at the station are usually temperate. The number of confirmed drunkards is about 1 man in 20. 2. The proportion of admissions into hospital from diseases directly caused by intemperance, as given from the returns of the last 10 years is 1 in 2·91, and the admissions indirectly are 1 in 7·54. The following table, showing the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station, is prepared from the returns of the last six years, no earlier records of crime being extant.

Classes.	Total Strength.	Admissions.	Deaths.	Ratio of Admissions to strength per Cent.	Ratio of Deaths to Strength per Cent.	Ratio of Deaths to Admissions per Cent.	Ratio of Crime to Strength per Cent.
Total abstinence -	12	3	—	25	—	—	—
Temperance - -	576	1,237	51	213·02	8·84	4·12	42·01
Drunkenness - -	387	676	55	174·67	14·21	8·13	426·87

Note.—Although the greater number of the men are usually temperate, yet with very few exceptions, they all drink occasionally, and the admissions into hospital from drunkenness and its effects are consequently numerous. Notwithstanding the high per-centage of crime from drunkenness, there were only three crimes of magnitude sufficient to call for courts-martial. Drunkenness is always punished as a crime.

3. Distilled spirits are sold both at the canteens and bazaar. The commissiarat rum sold in the canteen is 24 per cent. below proof. The amount consumed is about two drams for each man per diem. It is impossible to state the amount sold in the bazaar. Spirit does not form any part o a soldier's ration at the station, on march, or in the field. It is never given as a ration to convalescents. No other than intoxicating drinks are sold either at the canteen or bazaar.
4. The consumption of spirits generally is injurious, except to some few, who from long habit are accustomed to it. In my opinion, it is most destructive to the troops, both as regards their efficiency and internal discipline.
5. Spirit forms no part of the soldier's ration. The sale of spirit in the canteen is restricted to two drams per man per day. It is prohibited to be sold in the bazaar to Europeans, except by permission. It is sold clandestinely.
6. The influence of malt liquor is favourable to health. Wine is never given except in hospital. The continued use of spirit is destructive to health.
7. Coffee and tea are commonly used, ginger beer and lime sherbet are occasionally used. I think their use decidedly beneficial.
8. As before stated, spirit forms no part of the soldier's ration. Beer is procurable at the canteen. Tea and coffee are served out in the daily ration. It is optional with the soldier to purchase spirit or beer.
9. It would generally be beneficial to prohibit the sale of spirituous liquors in the canteens, but there are some old soldiers who prefer spirit to beer and other drinks, and from long habit could not dispense with their daily drams, and who, if they could not get it at the canteen, would get a worse liquor elsewhere.
10. As drunkenness is the common cause of disease and crime among troops in India, I recommend that troops should be discouraged by every possible means from acquiring a taste for spirit; that its use should be absolutely interdicted on the passage out, and that malt liquor should be supplied in its place.

CHUNAR. BENGAL.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	11. There is no regular canteen at the station. Twice a day, at regulated hours, it is opened for the sale of rum and beer. There is no military bazaar. The sale of spirits in the bazaar of the town is interdicted to soldiers, except they have written authority to purchase; and any dealer transgressing the rule, is subjected, if detected, to a heavy fine.
VI. DIET.	1. There is no difference in the composition of the rations served out to European troops of whatever denomination. The daily rations consist of 1 lb. of bread, 1 lb. vegetables, 1 lb. meat, 3 lbs. of firewood, 4 oz. of rice, 1 oz. of salt, 2½ oz. of sugar, ⅘ oz. of tea, or double the amount of coffee. Coffee is served out twice a week commonly, oftener, if the men like it. In the cold weather beef is mostly issued; in the hot weather, mutton. The inspection of the constituents of the ration is made by the adjutant and quartermaster serjeant. 2. There is a complete ration provided for the troops, including vegetables, but no fruit. There is no stoppage for rations. If absent on leave, and not provided with rations, the soldier is allowed as compensation, three annas and four pie per diem. The soldiers make three meals a day, one at 8 a.m., one at 1 p.m., and one at 7 p.m. Their meals are composed of their rations, with such additions as they choose to make. The proportion of vegetables which enter in the composition of the ration is 1 lb. 3. It is reasonable to suppose that any improvement in the ration would be conducive to the health of the troops of both services. No instance is on record of any part of the ration being sold. The rations are made over on the spot to the cooks, who manage the men's messing. 4. The cooks are paid by each mess. The apparatus for cooking is of the kind in use India; boilers, gridirons, frying-pans, &c. are provided by Government. The kitchens are clean, but deficient in light and ventilation. The water-supply is sufficient. The food is sometimes boiled or roasted; more frequently stewed; occasionally grilled. The cooking is properly done, and to the men's liking; and the same may be said of the tea and coffee. The battalion does not march. 5. Owing to the annual overflow of the Ganges, it would be difficult to find ground suitable for the establishment of gardens for the soldiers within a convenient distance, and the expense of providing water would be greater than the men would like to incur. From their age and general state of health I do not think they would care for a garden, except Government took upon itself the expense of managing it.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. A soldier's dress consists of head-dress, wicker helmet with cloth cover, and turban; dress, easy fitting khakee tunic, free and open in the neck, pantaloons of the same material and colour. As regards accoutrements—the Artillery wear only sword and waist belt—the Infantry carry the regulation musket, with cross-belt and pouch. In the cold weather cloth clothing is substituted for the khakee. The men provide their own under clothing. Great coats are allowed for the night sentries. I think the present dress is suitable for the climate and for the soldiers' duties. I think every soldier should be provided with two flannel shirts for cold weather wear, and two broad flannel abdominal belts to wear in the rainy season, and at any time when the bowels are relaxed. The guard dress is khakee or cloth according to the season. Sentries are protected from sun and wet by sentry boxes and covered sheds. In the cold weather they are provided with great coats.
Duties.	1. It would be advisable that recruits, especially those for the cavalry, should be thoroughly drilled at home before being sent out to India. 2. There is no drill in the invalid battalion. There are four inspection parades in the week at sunrise, when the men are told off for duty. I think the men would enjoy better health if they had more duty to perform. The best time for parade is from daybreak to 1½ hours after sunrise, for marches from 2 a.m. to 8 a.m. These remarks apply to Central India and Bengal. There are no general orders on the subject that I am aware of. The average number of nights the men have in bed during the week is 3½. 3. Guards are mounted within 100 yards of the barracks. Guards are relieved daily, sentries every two hours. There is a roll-call nightly. The effects of night guards is rather beneficial in the hot weather, and not prejudicial at other times except when epidemic fever prevails, and the sentry neglects the precaution of wearing a great coat.
VII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation at the station. There is no ball court, nor any skittle ground, but one is being constructed. There are two schools, one for boys, and one for girls, with efficient teachers. There is also a library and a reading room, but they are not open at night. There are neither day rooms, soldiers' clubs, soldiers' gardens, workshops, theatre, nor gymnasia. The present means are insufficient to keep the men occupied during the wet season and heat of the day. There are no restrictions as to exposure to sun and rain out of barracks when off duty. The men go about at all times, and except when under the influence of liquor, they do not appear to suffer from exposure. 2. To improve the existing means of recreation, a soldiers' club-room, with wide verandahs, which could also be used as a theatre, should be erected, also another skittle ground for the lower barracks, and a ball court. A gymnasium should also be constructed principally for children. 3. Soldiers' savings banks already exist, and have been found advantageous. 4. There is not sufficient shade from trees and other means to enable the men to take exercise without injury to health during the day. There were some beautiful trees in the fort, but they were cut down in the mutiny by order of the engineer officer. The verandahs do not afford sufficient protection.
IX. MILITARY PRISONS.	1. The cells are constructed of stone and badly ventilated; they are not fit for occupation in the hot weather, and are not used. I have recommended that the cells should be enlarged and otherwise altered, so as to admit of their being habitable at all seasons.
X. FIELD SERVICE.	1. There are no local regulations for field medical service, not included in the General Presidency Regulations. The invalid battalion is exempt from field service.

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	2. The arrangements as to the conduct of the line of march of troop, bivouacking, camping, billeting, &c. are directed by the Quartermaster-General's department, with the senior of which, Medical Officers communicate on all matters affecting the health and comfort of the troops. 3. As far as my experience enables me to judge, the regulations as to the selection of camping grounds, &c. are good and generally well observed. The senior medical officer in camp has the general superintendence of all sanitary arrangements, and his recommendations if beneficial and practicable are invariably attended to. In a large camp I think it would be advisable that a sanitary Medical Officer should be specially appointed; and, having no other duty to perform, should be held responsible for the due observance of all sanitary regulations. 4. The regulations and arrangements for field hospitals are fully described in the Bengal Regulations, chapter xxv., at page 153.
XI. Statistics of Sickness and Mortality.	No information under this head. Chunar is not a civil station, but latterly a civilian has been stationed there.
XII. Hospitals.	1, 2. The hospital is situated at the east end of the station on the corner of the road leading from the barrack square to the fort. It is to the west of the thatched barrack, from which it is distant 300 yards, and about the same distance from the nearest officer's stables. It is a quarter of a mile from the bazaar of the town of Chunar; on the opposite side of the road to the south, there is a row of native huts, and behind it the village of Mohana. The site is partially open and freely ventilated only on the north and west. The row of subordinate Medical Officers' quarters and the women's hospital interfere with the ventilation to the east, and the huts before described to the south. The site is generally healthy as to elevation, drainage, and absence of malaria. The ground is high and the elevation six feet. 3. The water-supply is abundant. 4. The refuse water and other impurities are carried off in a large drain, which commences at the north-east angle of the hospital, and runs parallel with the women's hospital. The outlet for the sewerage is 30 yards from the hospital. 5. The wards are all of the same height, viz., six feet above the ground. There is no free perflation under the floors; the floors are terraced and would not admit air. The greater part of the roof water is conveyed away in the drain before mentioned: towards the south-west corner it sinks into the subsoil. The ground on which the hospital stands being high the natural drainage is good; very little water remains on the surface at any time. The guttering is mostly confined to the south-west corner. I did not consider the drainage sufficient; I have communicated with the executive Engineer on the subject. The hospital is built of stone and mortar, the roofs and walls are single, the latter, however, are sufficiently thick to keep the hospital cool. Stone roofs, however thick, are always warmer than thatched ones, as they retain the heat. The hospital has outer verandahs, 10 feet wide, on the east and west sides, and an inner verandah, 12 feet wide, on the east, south, and west sides. These afford sufficient shelter on those sides; but a verandah over the entrance to the north is required. The inner verandahs have been used for the accommodation of the sick, but not for the last 20 years; they are now occasionally used by convalescents. The building is a one-storied building.

Table of Hospital Accommodation.

Date of construction is unknown; it was purchased in 1814.

Total number of wards, 4.

Total regulation number of beds, 46.

Hospital Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patients' Beds above the Floor.	Windows.		
		Length.	Breadth	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft. In.	Ft. In.	Ft. In.	Feet.			Ft. In.			
Two Middle Wards	16	61 9	17 9	17 4	18,994	1,187	68½	1 6	None.		
	6	26 4	19 10	15 0	7,851	1,308	87⅙	1 6			
Two Side Wards	12 each	118 8	15 8	7 0	31,588	1,316	77	1 6			

The hospital is not so placed as to receive entirely the full benefit of the prevailing winds. There are no windows.

6. The ventilation of the wards is effected by openings in the roof, which admit of a draught from the numerous doors, all of which are kept open at night, and some in the day. Occasionally, in the very hot weather, there is a feeling of closeness common to all stone roofed buildings. The lower thirds of the jalousies are fixed; the upper thirds open externally.
7. The wards are cooled by punkahs and kus-kus tatties, the construction of which is well known.
8. There are no artificial means of warming the wards. The walls and ceilings are whitewashed once a year, but oftener if required by the Medical Officer.
9. The privy is 50 feet from the hospital, and connected with it by a covered passage. It is 20 ft. long by 10 ft. wide, and has 10 stone seats on each side, with guttering for the urine, leading to the drain, which runs into the cesspit on the outside of the hospital compound wall. The privies are properly drained and supplied with water and

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	lime. They are not placed over a cesspit, and are not more offensive than such places are in this country. 10. The men commonly wash in the western verandah, and in the bathing room parted off from it. The hospital end of the covered passage to the privy is also available as a lavatory. The arrangements are sufficient. 11. There is a convenient bathing room at the south-west corner, with the doors opening into the inner and outer verandah, sufficient for the purpose of bathing the sick. 12. There is an establishment of dhobies (washermen) for washing and drying the hospital linen. The work is done at the river side, and the means are sufficient. 13. The storage is sufficient and dry. 14. The hospital cots are cane-bottomed, most of them 6 ft. 4 in. long and 2 ft. 9 in. wide, with a head rail. The mattress is stuffed with tow 2 in. thick, and made to fit the cot. One bolster and two pillows are allowed; and one thick country blanket, 7 by 5, one thick blanket covered with chintz, one sheet and two pillow-cases. Each man has a small carpet (setringee) for the bed side. In addition, I think every man should have a country quilt (ruzaee) for use in the cold weather. 15. The kitchen has been placed opposite the north-east corner of the hospital, at a distance of 28 yards. It is fitted with Hindostanee and English cooking apparatus to a sufficient extent. The cooking is properly done, and varied according to order. 16. Copies of the diet table, diet rolls, &c., in use in European hospitals are given in chap. xiii., pages 93 to 101, of the Bengal Medical Regulations. In the appendix of the same work the forms are laid down for all periodical returns, and from these the statistics of mortality, sickness, &c. are prepared. No other records than the copies of those returns are maintained. 17. One hospital serjeant performs the duty of overlooking the sick; there is no nurse or orderlies. There is a native establishment, consisting of one mate and six ward coolies, for attending upon the sick in the men's hospital, and an ayah and mehtranee in the women's. In every serious case requisition is made for a waiting man from the battalion, who is relieved daily. I do not think the attendance sufficient; the work falls very hard on the hospital serjeant. I think there should be two orderlies and a nurse for the women's ward. 18. The hospital is spacious and healthy, with ample accommodation for double the number of sick than are usually under treatment. I have never known or heard of any epidemic or particular disease appearing in the wards of this hospital. 19. I think a small verandah is required for the northern entrance to the hospital. I disapprove of the position of the privy and kitchen, which I think should be reversed. The row of subordinate officers' quarters interferes with the ventilation; but it would be difficult to find another site for them. If the strength of the battalion was much increased, it would be necessary to enforce attention to these points. I have called the attention of the executive Engineer to the necessity of giving a verandah on the north side of the hospital. 20. Convalescents in hospital are allowed to take the air on the river side; out of hospital they can walk on the ramparts of the fort, where the air of the morning is generally fine and clear. There is no place set apart for their use, and none I think required. 21. There is a hospital in the same compound as the men's for women and children, consisting of two wards and a verandah 10 feet wide all round. The building is thatched, and generally cool, and is well adapted for the purpose. I think the present arrangements are satisfactory, the only improvement I can suggest being the employment of a nurse in addition to the ayah and mehtranee. 22. There are no special local hospital regulations not included in the general Presidency Medical Regulations. 23. The Medical Officers' requisitions for repairs, for buildings, &c. are always attended to. On all matters relating to the comforts and diet of the sick, he exercises his own discretion, subject of course to a call for explanation from the superintending surgeon. 24. There are no wards for convalescents. The hospital affording ample accommodation for them. On being discharged from hospital it is usual to give the convalescent a few days' leave that he may gather strength before he is put upon duty. There would be no advantage in having a separate barrack for convalescents.
XIII. BURIAL OF THE DEAD.	1. The burial ground for British troops is in the N.E. corner of the station, about a mile from the fort, and 400 yards from the thatched barracks; and the prevailing winds being from the west, the position of the burial ground in reference to the station is favourable. 2. Its area is 85,984 square feet; the soil and subsoil are much alike, but there is a little more sand in the latter, both are of a light rich and slightly sandy mould. There is no artificial drainage; the water however does not lodge on the surface, but drains naturally into the adjoining Nuddee. It is not known whether decomposition takes place rapidly, as no old graves have been opened. The ground is kept clean. 3. No particular regulations as to grave space have hitherto been observed. The graves are mostly placed on a line, and are about 2 feet apart. The usual depth is from 5 to 6 feet; sometimes to admit of a corpse belonging to the same family, but not often, a grave has been reopened; but not more than two have ever been buried in the same grave. Interment is compulsory at ordinary times, in the cold weather on the following day, and in the hot weather within six hours, or as soon as the arrangements can be made. During epidemics interments take place as soon as possible. There are no native troops at the station. 4. I have never heard that the grave yard is offensive. When a British soldier dies in hospital, a death report is sent to the chaplain or priest, and to the Fort Adjutant, signed by the Medical Officer, who also names the time for the burial. 5. The dead of camp followers or bazaar people are generally burnt on the opposite bank of the Ganges. A few bodies are committed to the river. 6. No injury to the public health accrues from the present practice.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead—*cont.*	7. As regards the burial of the dead, the only improvement I can suggest is that some wheeled carriage might be allowed for the conveyance of the coffin from the dead house to the burial ground. Decomposition takes place so rapidly at times, that the men cannot shoulder the coffin without a feeling of annoyance.

(Signed) George Blake, Lieutenant-Colonel,
Commanding at Chunar.
H. M. Tweddell, Garrison Surgeon.
J. Hovenden, Major, Executive Engineer.

Date, 1st July 1860.

APPENDIX.

Note by the Garrison Surgeon.

The station of Chunar is occupied entirely by the European Invalid Battalion, consisting of two companies of artillery, and two companies of infantry. The average strength for the last 10 years is 180. The number of the women and children present with the battalion is 153. Unattached to it, but drawing pension and pay, are 34 widows and 26 children. There are besides a great number of pensioners with and without families, and widows * and children receiving no support from Government, who reside in the station and occupy the small houses in the vicinity of the barrack square. In 1846 Lord Hardinge proposed to remove the Invalid Battalion to Almorah; a measure strongly advocated by the late Sir Henry Lawrence, who was desirous that the women and children should have the benefit of a hill climate. This arrangement was frustrated at the time by the influence of the house proprietors at Chunar, but was not abandoned, and if Lord Hardinge had remained longer in India it would certainly have been carried into effect.

The present appears to be a proper time for reviving the subject. Two of the barracks in the fort have lately been condemned by a committee called for by the executive Engineer. It has been recommended that others be constructed in their places. There is only one barrack in the lower lines. For military purposes it is advisable that there should be barrack room in the fort for the entire battalion. During the late mutiny it was necessary to keep all the troops in the fort, and the want of proper barrack room was severely felt. The intercourse between the fort and the lower lines could not be maintained in disturbed times, except the strength of the garrison was greatly increased. But as the fort occupies a hill about 180 feet high, and it is difficult of access, having only one gateway, with a very steep ascent, the construction of barracks for the whole battalion, and women and children, would involve a large outlay. I think it advisable in every way to take up Lord Hardinge's plan, and remove the battalion to Almorah or some other hill station, where it would form the nucleus of an European colony. On their departure the fort might be held by a small detachment from Benares, for which the present accommodation would be ample; and as I consider the fort to be the healthiest part of the station, I would recommend it as a sanitarium for convalescents from Benares and Ghazeepore, who might require change of air for a few weeks in the cold and rainy season.

(Signed) H. M. Tweddell,
Senior Surgeon,
Garrison Surgeon.

* There are about 100 widows, most of whom are in destitute circumstances.

I fully concur with the Garrison Surgeon in this opinion.

(Signed) J. Hovenden, Major, Executive Engineer,
Benares Division.

I also concur with the Garrison Surgeon in his remarks above stated.

(Signed) George Blake, Lieutenant-Colonel,
Commanding at Chunar.

ALLAHABAD.

Accommodation	Queen's European Troops	Bengal Horse Artillery	74
		H. M. Royal Artillery	149
		Infantry	2,292
	Native Troops	Infantry	1,871

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is flat and intersected with nullahs (which form a natural means of drainage), and it is for the most part under cultivation. In some parts the country is rather sandy and dry, with the exception of a large portion of ground extending from the fort towards Papahmhow. This tract is under water in July, and remains so till after the fall of the river, in October or November, when a large portion of swampy ground is left immediately adjoining the station, productive of unhealthy exhalations. The ground on which the cantonment is built is comparatively high. There is a great deal of wood in the vicinity, principally mangoe topes; for instance, Alopee Bagh, also a large tope west of Papahmhow Ghât, which has been used with success as a camping ground in cases where troops have been driven from barracks by cholera. There is little or no jungle, and no water, with the exception of the rivers Ganges and Jumna, which wash the station. 2. The station is about 368 feet above the sea and about 40 feet above the surrounding country, in some parts less, and about 60 feet above the low-water levels of the rivers. One third of the station is actually below the level of the river. This part is protected from inundation by two very large earth embankments or bunds. There is some higher ground adjoining the station in the direction of Kutchpoorwa, higher than a portion of the present cantonment, as the level decreases towards the apex of the "Doab," where the fort is situated. This situation appears to have great advantages in a military point of view, but before going into the question, it would be well to mention some of the disadvantages of the present cantonment situation. There are two separate cantonments. It would appear that as occasion required, in 1858, different lines of temporary barracks were built in the most eligible spot for each individual set of barracks, but without any view to

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References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	their being brought into one cantonment afterwards. Large civil bazaars separate these barracks. One set of lines (the Kuttra hospitals) is immediately adjoining a large civil bazaar. The evils of this are manifest, as no exertions on the part of the authorities, however persevering, can keep these lines as free from filth and injurious smells as they would be in a cleanly situation. Again, the advantages which the vicinity of these bazaars offer to breaches of discipline are great, more especially the difficulty of detecting the shops where liquor is sold to the soldier. The ground mentioned in the neighbourhood of Kutchpoorwa is free from these disadvantages, being open, and suitable as a site for new cantonments. 3. Due south from this, running east and west, are the Kymore Hills, upwards of 2,000 feet in height. From Mirzapore, on the Ganges, a branch or spur of this range, in some places 1,000 feet high, is within 15 miles. 4. The Jumna and Ganges wash the station. A large portion of the station on the river side of the "Bund," extending from the Fort to Papahmhow, is under water during the rainy season of every year—from the commencement of July to the end of October. There is much broken ground on that part subtending the river Ganges, exercising a deleterious influence on the health of those troops stationed in the vicinity of those ravines or broken ground. 5. The station is not so much encumbered with trees as to be unhealthy. The lower branches are lopped off to a height of 12 feet from the ground, to admit of ventilation. The station is open, and freely exposed to winds. The temperature is raised by reflected sun heat from the dry, light coloured, and denuded surface of the ground. Hot westerly winds prevail during April, May, and part of June, favourable to health generally. During the cholera of 1859 the disease, which broke out after a continuance of easterly winds, invariably subsided when the wind veered round to the west, and increased as surely when the wind returned to the east. 6. The surrounding country is under cultivation for grain and indigo. Irrigation is carried on by wells, but to so small an extent as not to be considered injurious to health. The cultivation of rice is prohibited within one mile of the cantonment or civil station boundaries. The land in the neighbourhood is not suited to the growth of rice. Indigo is cultivated at Papahmhow, close to Wellington Barracks. During its preparation, most nauseous effluvia are given off. It is a nuisance, but has not been observed to be injurious to health. 7. Allahabad, with a population of 73,000 inhabitants, is about 2½ miles from the Clydesdale and Mansfield Barracks, and 3½ miles from Chatham and Wellington Barracks. 8. The general geological structure of the soil is kunkur or clay, charged with calcareous nodules, on a substratum of fine sand. The ground adjacent to the river consists of fine sand, with a clay substratum. The ground occupied by troops has not been occupied by native population previous to its being made the site of cantonments. 9. Water is found during the dry season at a depth of 60 feet, and during the wet season at a depth of about 45 feet. 10. The station generally has a natural drainage by a fall towards the rivers Jumna and Ganges, which almost encircle it. The extensive plain within the "Bund," between the station and the fort, is flooded in the rainy season owing to its flatness, the water either sinking into the subsoil or disappearing from the surface by evaporation. The station is not affected by drainage from any higher ground adjacent. 11. The water-supply is derived entirely from wells; it is not stored in tanks. There are two tanks of limited extent about half way between the station and the fort. They are dry during the whole of the hot season, and are only full during the height of the rainy season in July and August. The drinking or well water is quite free from animalcules or infusoria when examined under the microscope. Bathing in the tanks is prohibited. The wells in general are protected from pollution from leaves or other matters falling into them. No nuisance or malaria arises from the tanks without or within the station. 12. If the wells be secured, of a proper depth, and clean, they afford an abundant supply of water, colourless, of good taste, and devoid of smell. The water contains carbonate of lime, and is hard in quality. It is improved by filtration. It is raised and distributed by bullocks and water carriers. The best means seem to be adopted for the purpose of ensuring an abundant supply of the best water. 13. No other points require consideration beyond those on which information is sought. The station may be said to be in a transition state at present. The barracks being, with the exception of those in the fort, of a temporary character, and not likely to be available for any lengthened period. 14. Stations are selected by a mixed military and medical committee, appointed by the Commander-in-Chief. Hill stations are selected partially on the report of observations made by a medical officer commissioned to reside there, and to consider accurately the fitness of the place as a residence for troops. This proceeding has hitherto worked satisfactorily.
II. CLIMATE.	1. 2. No records. They were destroyed, as well as the meteorological instruments, at the time of the mutiny. 3. The seasons may be divided into three periods. The dry embracing March, April, May, and June; the wet season, from July to November; the cold season, from October to March. These periods are steady. Being within the influence of the S.W. monsoon, the season of rains is regular, not depending on tree planting or canal irrigation. In the dry season the air is frequently heavily laden with dust, and dust storms, at times violent, occur. This condition is not supposed to exercise an unhealthy influence. The climate requires generous and varied diet; clothing adapted to the several change of seasons and periods of the day and night; a large amount of cubic space to each man. Houses well raised above the surface of the ground, with good ventilation and well fitting doors; thick walls and roofs capable of resisting heat. The barracks at present occupied here do not fulfil these conditions, but the clothing seems well suited to the climate. The climate absolutely demands that the duties should be as light during the hot and rainy seasons as the service may admit of. As regards the relative healthiness of the different months, it may be stated that in April, May, and June fever, dysentery, sun-stroke, and

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	cholera appear. During the rains dysentery and cholera, and in the cold season fevers chiefly of the intermittent type. November, December, January, February, and March are, as a rule, the most healthy months. 4. A spot might be selected within 50 miles of the station, on the table-land of India, in the Rewah district, at an elevation of 1,500 or 2,000 feet above the level of the sea. An inquiry is invited on this important head, as convalescence is very protracted after severe illness at this station.
III. Sanitary Condition of Station.	1. 2. 3. Plans. 4. The following is the barrack accommodation :— Date of construction, 1858–59. Total regulation number of non-commissioned officers and men, 4,280. Total number of rooms or huts, 46.

Barrack Rooms.	Regulation Number of Men per Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area per Man.	Height of Men's beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width
		Ft.	Ft.	Ft.	Ft.		Ft.	Ft.			
Mansfield Barracks, Nos. 1 to 10	100	335	22	16	143,715	1,437	73·7	2			
		335	22	7½							
Clydesdale Barracks, Nos. 1 to 10	100	335	22	16	143,715	1,437	73·7	2			
		335	22	7½							
Kuttra Barracks, Nos. 1 to 4	100	335	22	16	143,715	1,437	73·7	2			
		335	22	7½							
Chatham Barracks, Nos. 1 to 10	100	335	24	16	160,960	1,609	80·4	2			
		335	24	8½							
Horse Artillery Barracks, Nos. 1, 2	100	335	24	16	160,960	1,609	80·4	2			
		335	24	8½							
Wellington Barracks, Nos. 1 to 8	80	300	22	15	122,100	1,528	82·5	2			
		300	22	7½							
Wellington, Married Quarters, 1, 2	40 families, each 2 rooms	16	12	15	4,032	4,032 per family	218 per family	2			
		8	12	12							
Guard Rooms.											
Mansfield lines	16	80	16	15	23,040	1,440	80·	2			
		80	16	6½							
Clydesdale lines	16	80	16	15	23,040	1,440	80·	2			
		80	16	6½							
Chatham lines	9	30	16	15½	8,880	987	53·	2			
		30	16	6½							
Wellington lines	18	68	16	13½	20,110	1,117	60·5	2			
		68	16	6½							
Prison Cells.											
Mansfield lines, 8 cells	1	10	8	12	960	960	80·	2			
Clydesdale lines, 12 cells	1	8	6	16	768	768	48·	2			
Wellington lines, 8 cells	1	8	6	16	768	768	48·	2			

5. There are no windows to the barracks. There are folding doors opening inwards, and for the most part badly fitting. The doors are the same on both sides, and opposite each other. They have no jalousies. All the barracks have verandahs, 15 feet in width on both sides. These verandahs are not used as sleeping quarters except on emergencies.
6. The cots are of wood, with cordage bottoms. They harbour vermin and are easily broken. Iron cots with sacking bottoms are infinitely better. The bedding consists of 1 cotton setringee or carpet, 1 quilt, 1 country blanket, 2 sheets,
7. The tent used by European privates is 20 feet long and 16 feet wide, 10½ feet high inside and 12 feet outside. It is double poled with double flies, the outer fly having 3, the inner 2 cloths. The walls are 5½ feet high, composed of 3 cloths. There are four doors, one on each side. Each tent holds 16 men. To each man is allowed 20 superficial and 140 cubic feet. The tent, "Staff Serjeants," holds one man; it is 12 feet square, 12 feet high; single poled with double flies, of 3 cloths each; wall of 4 cloths, with 2 doors. The superficial area is 144 feet, and the cubic space 960 feet per man. Tent, "Sepoy," is 32 feet long, 16 feet wide, and 8½ feet high. It consists of a single fly, with a wall or fringe 1 foot deep, and is intended for half a company of sepoys. Cubic contents, 2,176 feet.
8. The barrack ventilation is imperfect; by doors, and in some instances in addition by small semilunar windows over the doors, and by roof ventilation. In cells by small gratings. In no instance, except at the Mansfield barracks is there thorough ventilation in the cells. Generally the ventilation is insufficient, especially as the doors, which are almost the only means of ventilation, have to be closed during high winds, dust storms, and rain with wind.
   The air is cooled by tatties applied to the doors on the windward side in the hot months, and by punkahs.
9. As to materials, the barrack walls are constructed partly of burnt, partly of sun-dried bricks. Roofs in some instances of thatch, in others of thatch and tiles. Tents are of the cloth of the country, and of excellent materials.
10. The floors are of flags, not raised sufficiently, and there is no provision for a current of air below them.
11. The barracks at this station are all of a temporary character. The walls of sun dried bricks, the roofs of grass in bamboo frames. The materials are suited to the class of buildings, but would not be suited for permanent buildings, as they fall rapidly into decay, the walls become sapped by white ants, and the materials of the roof are speedily consumed. Constant repair may maintain them for some years in a habitable state, but they eventually become unsafe. The Executive Engineer considers the construction deficient. The system

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References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	of continuous roof ventilators is objectionable, as liable to damage by storms, and admitting hot winds, dust, and rain. Ventilation by opposite windows would be better. The barracks are handed over to the Barrack Master, by whom all small repairs are executed. When out of repair the barracks are vacated, and placed under the Executive Engineer till rendered habitable. The Sanitary Officer reports to the station authorities all matters coming under his own or brought to his knowledge by the Medical Officers. The Deputy Quartermaster-General, Executive Engineer, Barrack Master, and Cantonment Magistrate carry out all sanitary measures. Cleansing and lime-washing of walls and ceilings is done once in twelve months in permanent barracks, in accordance with the regulations. In temporary barracks lime-washing is required more frequently. 12. The lavatories are separate from the barracks. They are supplied with cast-iron basins, lined with porcelain, and in each lavatory is a masonry foot bath 7 feet by 1½ feet by 1½ feet. The basins stand on wooden platforms, and a masonry trough is carried below them, into which the water flows, and runs into shallow wells or cesspools. Water is supplied to the basins from the wells by bheesties. 13. Cooking is carried on in portable coppers placed over open fireplaces. Water is supplied by bheesties; the refuse water runs into small cesspools outside the buildings, whence it is removed daily by the Conservancy Establishment. Washing is done by native washermen. It is satisfactory, but the process is very destructive to the linen. 14. The privies are cleansed at regular intervals by the Conservancy Establishment. They are not drained or sewered. The flooring of the privy has a sharp slope to the rear to convey the contents into a stone trough outside the building, which is cleansed by hand labour. 15. The privy buildings are ventilated at the ridge. The barracks are lighted at night by lanterns with oil burners, and in the opinion of the committee, imperfectly. 16. There are no drains or sewers. Each barrack has a small channel about a foot deep at a distance of 10 feet from the walls, the intermediate space being made to slope from the barrack. These channels communicate with one another, and are carried out into ravines or low ground so as to allow the water to run off freely. There are no cesspools properly so called, but attached to each wash-house is a shallow well into which the water runs and is absorbed. In the wash-house of the Kuttra hospitals a shallow tank has been built in place of the cesspool. It is emptied morning and evening, and is found to answer well. The surface water runs off freely from the barracks. The drainage is much facilitated by the ravines. The buildings are in some instances slightly raised above the ground by a plinth. In some instances their floor is below the level of the surface, in which cases the building is damp. The Executive Engineer is of opinion that the barracks generally are not sufficiently raised. Some of them are on high plinths, while others are built below the surface of the ground, and are damp in the rains. The injurious effect in health to men dwelling in buildings like these latter is obvious. As regards the efficiency, or otherwise, of the drainage, the surplus water partially evaporates, partially sinks into the subsoil, while the greater portion runs off by natural drainage. There is one cesspool at the end of each lavatory 6 feet in depth and 6 feet in diameter. These cesspools are at various distances from the wells, but in no instance so near as to affect the purity of the water in them. These cesspools are from 10 to 30 paces from the nearest men's quarter. They are cleaned out once daily by the regimental Conservancy Establishment. There are no foul ditches near to barracks. The contents of the privies are carted away and deposited at long distances from the barracks. 17. Surface cleansing is carried on by a general Conservancy Establishment under the Barrack Master. It is done as effectively as possible in a cantonment where civil bazaars intervene between the different lines, and where enormous excavations exist (originally made by the Public Works Department for the erection of barracks), the cost of filling up which would be very heavy, and perhaps not justifiable, as the barracks are all temporary. 18. The surface of the cantonment itself is kept free of injurious vegetation. There are no old walls or thick hedges interfering with ventilation. 19. There are no military bazaars, except those of the several regiments, in which cleanliness, order, and regularity prevail. There are regular patrols of police for preserving order and cleanliness in the Sudder Bazaar and cantonments. Any person found committing a nuisance is severely punished by the Cantonment Magistrate. The cantonment police is found efficient. The native houses near the station are generally clean and free from dung heaps and filth. There is no nuisance experienced from wind blowing over the native dwellings. 20. The slaughter-houses are situated close on the north-west limit of the cantonments, and at a point equidistant from the barracks, the fort, and Kutchpoorwa station. They are inspected by the Deputy Commissary-General periodically, and frequently by the Assistant Commissary-General. The premises are kept scrupulously clean. Dung is sold for fuel and offal for manure. The blood is offensive. It is received into open headed casks, and emptied into covered cesspools with stink traps. The slaughter-house is as free from taint as the enclosure of any residence at the station. 21. A few ponies are attached to each regimental bazaar, and are picketed at some distance from it. The manure is removed by the soil carts of the respective barracks. 22. The horse lines are about 65 yards from the barracks and 300 yards from the hospital. There are no regular dung heaps. The manure is thrown out about 130 yards from barracks and carted away from time to time. The horses are separated by small mud divisions, renewed by the brickmakers every two or three days. 23. The quarters for married people are sufficient. No married couples inhabit the same quarters with single men.
Officers' Quarters.	1. Officers for the most part occupy bungalows in the vicinity of their regiments. They are nearly all new and built on good sanitary principles. Long experience has proved that bungalows on the present plan are admirably adapted for the climate.

References to Subjects and Queries.	Replies.
IV. Health of the Troops.	1, 2. The native population is on the whole healthy. The more common diseases among them are fevers of the intermittent and remittent types, cholera, dysentery, and a peculiar paralytic affection of the loins produced by eating a description of pulse (*Lathyrus sativus*) grown chiefly in the district of Barrah. 3. The comparative healthiness of the native population arises from their having full occupation and an abundant supply of food and water. 4. The sanitary condition of the troops at the station is uniform. Troops stationed at the fort at the season when the river recedes from its banks are specially liable to intermittent fevers. 5. It has not been the practice at this station to camp out the troops except during epidemics of cholera, when this proceeding has been found most efficacious in checking the disease. 6, 7, 8. Occasional residence on the hills is strongly recommended. It would exercise on the health of the troops, as well as tend to dispel *ennui*. Their *morale* too would be improved, as the regimental authorities could exercise effectual contro as regards indulgence in drink, and venereal disease would be less frequent. This disease and drink are fertile sources of admissions to hospital. 9. Diarrhœa prevails at hill stations, but the liability to this disease is neither so probable nor so general as to make it a ground for denying the men those other benefits certain to be reaped in a hill climate. 10. Barracks well placed, and sufficiently raised from the damp surface, and the adoption of flannel to guard the chest and abdomen, would contribute greatly to give immunity from bowel complaints in hill stations. 11. In going to hill sanitaria weakly men should leave the plains before the setting in of the hot season. They should arrive at the hill sanitarium not later than the 1st April, so as to have from 2 to 2½ months' residence, before the setting in of the periodical rains. They should remain until the 1st of January, except those suffering from chronic rheumatism, and they should return, remain throughout the snowy season, the alterative period of the hill climate. The above are the shortest periods in which benefit would accrue to the sick. 12. It is improbable that any amount of hill residence should give additional predisposition to the diseases of the plains. 13. No precautions are necessary in transferring troops from the hills to the plains, if it is done at the proper period of the year. 14. Men should have the benefit of occasional residence in the hills, but there is no necessity for keeping them there permanently. The standard of health among the troops in the upper provinces is, as a rule, not inferior to that of troops on the hills. Frequent change of station is not necessary, as affecting the health and spirits of the troops under ordinary circumstances. If their *morale* has suffered from special trials, severe epidemics, or harassing duties, a change of quarters might be desirable. The men themselves prefer a continued residence for three or four years. This is shown by the contented condition of the British cavalry regiments at Bangalore, in the Madras presidency. 15. 16. The average height of the hill stations above the level of the sea is about 6,000 feet. The most satisfactory results are obtained at this elevation. 17. The table-land of India, already mentioned, in the direction of the Rewah hills, might afford a site for a sanitarium. Its height is from 1,000 to 1,400 feet above the sea level; it is accessible by roads easily improved, and is about 45 miles distant from Allahabad. This has special reference to Allahabad, where convalescence is very slow, and would be much accelerated at the above elevation. 18. As regards the comparative healthiness of particular soils for stations, the Kunkur soil, being dry, is preferable to the deep black cotton ground in the plains and valleys of Bundlecund. 19. Twenty is the best age for soldiers proceeding to India. The best period of the year for troops arriving in India is from November to January. On arrival at Calcutta the troops generally proceed to Fort William, Dum Dum, or Barrackpore, and proceed to the upper country by steamers; by the trunk road by marching or by bullock train. Their clothing is at once adapted to the season, and they are not subjected to drills or marches prejudicial to health. The precautions requisite are avoidance of drink and of exposure to the sun, moderate drill and attention to clothing, well constructed barracks, lavatories, cells, guard rooms, and sources of amusement suited to the climate. 20. Troops should be kept at home until fully drilled and of proper age, and should then be sent to India direct. It would be highly advantageous to the troops to proceed to the hills on landing, but as the exigencies of the service will not admit of this, the relief should be so arranged in time of peace as to give each regiment its tour of residence in a hill climate as early as possible, and afterwards in succession. 21. Troops reach the interior, 1, by bullock train, admirably conducted; 2, by regular marches; 3, by steam. In the last case great care should be taken to avoid overcrowding, especially in the case of transport of sick or invalids. 22. Twelve years in the best period for service of the British soldier in India. 23. There is an excellent consent among the Medical Officers composing medical boards. 24. The best period of the year for invalids to leave India for home is January and February. Thus troops arrive at a genial season in England, and travel in a cool season to the port of embarkation in India.
Diseases.	1. Regular health inspections take place weekly; during epidemics daily. 2. The only cases of scorbutus have been in a few recruits arriving after a long sea voyage, 3. The proportion of cases of hepatic disease in this circle in 1858–59 was 1 in 20 strength 1 in 37 treated; 1 in 22 proved fatal. The disease is attributable to climate and intemperance. It occasionally supervenes in fever, and is generally found complicated with disease of the large intestines. Its frequency might be diminished by abolishing the use of spirits, added to the strictest attention to cleanliness, clothing, nature of duties, quality of food, efficient housing, and healthy recreation. 4. At this station dracunculus is almost unknown. 5. The proportion of sick from venereal diseases to the constantly sick is as 1 to 11. By lock

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—Diseases—*cont.*	hospitals, the registration of women, and stringent police regulations in connexion with those women, much good in the way of prevention might be done. 6. The troops at this station suffer from endemic, remittent, intermittent, and common continued fevers and dysentery, epidemic cholera and small-pox, and endemic rheumatism. The following are the proportions which the admissions and deaths from each disease bear to the total admissions and deaths, which are obtained from data since the mutiny, no other being available:—

	Admissions.	Deaths.
Fevers	50 per cent.	less than 1 per cent.
Dysentery	5½ „	11 „
Small-pox	1½ „	2 in 13
Rheumatism	5 „	

7. The nosological characters of these diseases are *Dysentery*, acute and chronic; *Diarrhœa*, acute and chronic; *Fevers*, intermittent, remittent, and continued; *Hepatitis*, acute and chronic; *Cholera*, sporadic and epidemic.
Cholera, dysentery, and sun-stroke are most common during the hot season. Cholera and dysentery in the rains. Fevers, during the cold season; generally mild, continued, or intermittent. Remittent and epidemic fever during the hot and rainy seasons.
It has been particularly noticed that the advent of an east wind, while cholera prevailed, has materially increased the spread of this disease.
The sanitary condition of the native dwellings where these diseases prevail, taking into consideration the character of native dwellings and the habits of the people, may be considered unobjectionable.
Exposure to the sun, and living in crowded dwellings are predisposing causes of disease among the native population. Living in a tropical climate, where the sun's heat is fierce, naturally predisposes to disease among European troops, to whose health and constitution such a condition of climate is antagonistic.
8. Exposure, although as little subjected to it as the service admits of, night duties, want of occupation, want of suitable recreations, produce a certain amount of *ennui* and weariness, which must indirectly contribute to the production of disease. Troops are observed to be more healthy when on the march or engaged in active operations than when in cantonments.
9. Quinine has been tried as a prophylactic in a very limited degree.
10. With regard to the prevention or mitigation of epidemic disease, the following measures are recommended:—Keeping troops in motion. Removing them from the locality where the outbreak occurs. Cutting off communication from the hospital and camp as far as practicable. Special hospitals for the then existing epidemic. Frequent inspections for the detection of incipient diseases, and giving encouragement to the men to report themselves sick at an early period.

V. INTEMPERANCE.	1. The soldiers at the station are temperate. There are very few confirmed drunkards; about 1 per cent. 2. Of 5,021 admissions in the circle during 1859, there occurred 36 cases of delirium tremens, 5 of which were fatal, and 25 cases of ebrietas. On account of loss of records during the mutiny, there are no means of arriving, with any degree of accuracy, as to the amount of disease indirectly produced by intemperance. There is little doubt that many diseases, especially those affecting the liver, are indirectly produced by drink; still, from reports from the several commanding officers at this station of the very few confirmed drunkards in their regiments, as well as from their testimony as to the generally temperate condition of the men, the Committee hesitate in stating that much sickness and mortality indirectly proceed from intemperance. Drunkenness *per se* is punished as an offence. 3. Spirits are sold at the canteens, but not at the bazaars. The probable daily amount consumed per man is less than one dram a day. The quality is good, and 24 per cent. under London proof. No spirits are included in the rations, neither for healthy men nor for convalescents. There are no intoxicating drinks sold in the bazaars. 4. The consumption of spirits is considered to be injurious to health. The quantity issued from the regimental canteens is not considered to affect the efficiency and internal discipline of the troops, but that obtainable by the men from other sources decidedly so. 5. 6. In exceptional cases spirits might be administered with advantage under medical superintendence, if practicable. But the entire substitution of malt liquor in canteens for spirits cannot be otherwise than beneficial to the health of the troops. While the use of spirits is to be condemned, the moderate use of sound malt liquor and pure wines is highly advantageous. 7. Coffee, tea, lemonade, &c. are much used. They are a comfort to the men, but not to the exclusion of sound malt liquor or good wine. 8. It would be beneficial to suppress spirits, and to substitute light drinks and malt liquor. 9, 10. The sale of spirits should be prohibited in canteens, and only those drinks mentioned permitted to be sold. The drinks sold should be the best of their kind, under such conditions as would ensure frequent inspection by the bazaar master or other competent authority. 11. (Canteen regulations of 48th, 70th, and 75th regiments transmitted) abstract as follows: 48th Regiment.—Only rum and malt liquor from commissariat to be sold. Each man allowed one quart of beer and two drams of rum per diem. Beer 3 annas per quart, rum 1 anna per dram. No rum to be served before evening. Canteen open from 12 to ½ to 1 to issue beer for men's dinners, and from 6 p.m. to tattoo first post, when men may drink their liquor on the premises. One dram of rum only to be served out at a time. Liquor cannot be taken from canteen and men not to drink each other's liquor, but only their own quantity. A native to attend at the canteen with coffee, bread, butter, cheese, lime juice, &c. for the use of the men who want them. Prices to be hung up. (Other regulations as to general management, guards, checking issues, &c.) All stated to be strictly carried out. 70th Regiment.—Canteen to be cleared at the quarter bugle before tattoo. No men on duty, defaulters, convalescents, or men with appearance of drink to be admitted, nor men of other corps without a pass from commanding officer. No liquor to be taken out of canteen without a pass, or unless for serjeants' mess. Canteen to be open from 1 till 2 p.m. A quart of beer or porter may be issued to each man, but no spirits till after evening parade. Daily issues per man not to exceed one quart malt liquor and one dram rum; or two drams rum

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	and no malt liquor. Each soldier provided with tickets to check issues. Soldiers not to drink together in canteens, or lend their tin pots, or give each other liquor. 75th Regiment.—These regulations refer mainly to the receipt and care of rum at the canteen. There are no times for opening or closing the canteen; there are no regulations as to the amount per man to be issued, only the number of drams each company has been supplied with is to be returned, and no liquor is to be taken out of the canteen.
VI. Diet.	1. The ration consists of 1 lb. bread, 1 lb. beef or mutton, the latter twice a week, $\frac{5}{7}$ oz. tea, or $1\frac{3}{7}$ oz. coffee, 2 oz. 8 drs. of sugar, 4 oz. rice, 1 oz. salt, 3 lbs. firewood, 1 lb. potatoes, or such vegetables as may be in season. The rations do not vary except in regard to vegetables. The present proportions are $\frac{7}{8}$ lb. of potatoes and $\frac{1}{8}$ lb. of onions for soup. The ration is inspected by the Quartermaster, Subaltern of the day, Captain of the week, and by a Commissariat subordinate. 2. A complete ration without stoppages is supplied. The men have three meals daily, breakfast at 7 a.m. in summer and 8 in winter; dinner at 1 p.m.; tea at $5\frac{1}{2}$ p.m. in summer and 5 in winter. 3. As regards quality, the food products of the country are rendered properly available, and the soldiers generally seem to be content with the present system of rationing. A non-commissioned officer of each company is responsible for drawing the rations, seeing them cooked, and that no part is disposed of otherwise than is intended. 4. For cooking each company has a cookhouse and utensils, one head cook and seven coolies, the latter are paid by the company at the rate of 10 annas per man per month. The kitchens are clean, well ventilated, and sufficiently supplied with water, but the water falls off before the rainy months. The food is boiled, roasted, stewed, or curried, as desired by the men. It is sufficiently varied and properly done. Tea and coffee are also properly prepared. Coffee is provided for the men on march at a small charge. Rations are issued immediately on the arrival of the men in camp. 5. Soldiers' gardens for the cultivation of vegetables, &c. might be advantageously established in the vicinity of the barracks.
VII. Dress, Accoutrements, and Duties.	1. In the hot and rainy season the clothing consists of cotton or khakee coat and trousers, wicker helmet with wadded khakee cover, woollen socks, ammunition boots and cholera belts, with the usual accoutrements. In winter a serge tunic and check cloth trousers and forage cap. Great coat of stout warm woollen cloth. The clothing has been subject of much consideration, and is admirably adapted according to the seasons and men's duties. There is little room for improvement, except in quality of material. Trousers of a less coarse texture for the cold season, and drawers, would be much more comfortable. The present trousers are of a spongy, bad, heavy texture, and gall the men on march. In most regiments the men on guard have a second suit of clothing for change in wet weather.
Duties.	1. Young soldiers should be thoroughly drilled at home before being sent out to India. 2. There is a little drill in the hot season at early hours or at sunset. Guards are relieved every 24 hours. In winter there is sufficient drill to give the men wholesome exercise. They do not suffer in health from drills. The best hours for drill and parades are from 5 to $6\frac{1}{2}$ a.m. in summer, and after sunrise in winter. After sunset in the hot season. There are orders to this effect, which are strictly obeyed. The men have consecutively eight or nine nights in bed between each turn of guards. 3. There are few guards mounted more than one mile from barracks. The roll calls are as follow:—In the 48th regiment six roll calls daily; in the 70th, at all meals and at tattoo; 75th, the same. The effect of night guards is without doubt injurious to health. As precautions, the men should be suitably clothed according to the season, and have a change of clothes on returning wet from sentry duty.
VIII. Instruction and Recreation.	1. There are skittle grounds, but no ball courts at the station. Covered ways should be used to the skittle grounds. There are schools, and good schoolmasters. In some corps there are good libraries, with reading rooms well lighted; but generally the lighting is defective. There are no day rooms, soldiers' clubs, workshops, nor soldiers' gardens. All commanding officers here concur in recommending workshops for the men. There is no theatre nor gymnasium. The means of recreation provided are not sufficient for the men in hot or wet weather. There is a stringent order against European soldiers leaving barrack rooms from 8 a.m. to 5 p.m. during the hot and rainy season. It is most beneficial to health. 2. The means of recreation alluded to above would be sufficient. 3. Savings banks have existed in all European regiments since 1833, and are found to be highly advantageous. 4. The men take exercise in the verandahs. The station is well planted with fine forest trees, but not in the immediate vicinity of the barracks.
IX. Military Prisons.	1. The cells at this station are generally defective. They are small, ill ventilated, not well situated, and not provided with lavatories or latrines. Their condition has recently been under consideration with reference to building new cells.
X. Field Service.	1. The Bengal Medical Code, and the report of Superintending Surgeon Renny and Field Surgeon M'Rae are considered guides for field medical service. 2. Due weight is given to suggestions from medical officers as regards sanitary arrangements for the march, bivouacking, camping, &c. 3. The sanitary regulations for camping are as follows:—"Along the grand lines of road, ground for camping is marked out by posts. Strict regulations for the cleanliness of these spots are in force. Wells are provided at these places. Operations for protecting health in camp are carried out under the Medical Officer and Quartermaster, and their suggestions are attended to by Commanding Officers. 4. The regulations referred to above contain the arrangements for field hospitals, ambulances, &c.
XI. Statistics of Sickness and Mortality, I.A.	No information.

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ALLAHABAD.
BENGAL.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. The hospital plan is precisely the same as the barrack plan. 2. The hospitals are situated within 200 or 300 yards of their respective lines, and are in no case under the influence of proximity to stables or bazaars. The buildings are open and freely ventilated, and the ventilation is not obstructed by high buildings, trees, &c. They occupy the best sites within the lines. There is some broken ground in the vicinity of the Chatham lines, but no noxious effluvia. 3. The water is good and wholesome. It is filtered through sand and charcoal. The wells require to be cleansed and deepened occasionally. 4. The hospital drainage is very imperfect and inadequate to carry off the water during the rains. The surface drains carry off much of the surface water into the ravines. Other impurities are removed by hand or by conservancy carts. 5. The floors are in most instances on a level with the ground, and there is a total want of free perflation of air beneath them. It would be highly desirable that the buildings should be elevated several feet above the ground, as much malaria must necessarily arise during the rains. Most of the roof water sinks into the subsoil, owing to the flatness of the ground and the imperfect nature of the drainage. The means of surface drainage consist of shallow narrow guttering too small to accomplish the objects intended, and insufficient to carry away the rain-fall rapidly. The buildings are constructed, partly of baked partly of sun-burnt bricks; surrounded on all sides by verandahs 15 feet wide; roofs in some instances of thatch, in others of tile and thatch; in both cases insufficiently thick to keep the buildings cool. The walls are sufficiently thick. The verandahs are very seldom used for sick except on a great emergency. The buildings are on one floor only. The following is the accommodation:—

Hospitals.	Wards.	Regulation Number of Sick Persons.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area per Bed.	Height of Patients' Beds above the Floor.	Windows.		
			Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
	Nos.		Ft.	Ft.	Ft.	Ft.		Ft.	Ft.			
General Depôt	3	100	327	25	15·5	126,712	1,267	40	2			
	5	100	327	25	15·5	126,712	1,267	40	2			
	6	100	327	25	15·5	126,712	1,267	40	2			
	7	100	327	25	15·5	126,712	1,267	40	2			
Royal Artillery	1	100	335·5	24	15·	127,750	1,277	80½	2			
Clydesdale	1	100	340	26	23·	203,320	2,033	88½	2			
Wellington	2	100	340	26	23·	203,320	2,033	88½	2			
	1	80	300	22	12·	79,200	990	82	2			

Total accommodation, 780 sick. Date of construction of hospitals, 1858–59. Wards, 8. The aspect of the hospitals is east and west, so as to have the advantage of the west winds during the months of March, April, May, and part of June.

In most instances there are no windows except small semilunar orifices over the doors, sometimes glazed, in other cases open. The plan of ventilation is on the whole very defective.

6. The ventilation is by means of doors, and of an interval between the main roof and a second shallow roof superimposed, through which interval hot air is given exit to. Under circumstances which require the doors to be closed (as during high winds), this mode of ventilation is by no means successful. There are no jalousies, or jhilmils to the doors.
7. During the hot winds, from 15th April to 15th June, the ordinary tatties are used for cooling the air. Fresh grass is used every year, as the old tatties become offensive. They are put into each opening on the windward side. Tatties for a hospital or temporary barrack would cost 200 rupees.
8. Warming is seldom necessary, but were it so there are no means of affording it.

   The hospital walls and ceilings are cleansed as often as the Medical Officer considers it necessary.
9. The privies are situated about 25 yards from the hospitals. Access to them is gained by covered ways. The soil is removed daily or oftener, and lime plentifully supplied with a view to counteracting noxious effluvia. Urinals are attached to these buildings. The urine is received into cesspools, which are daily emptied. The drainage is not perfect, although it cannot be said they are offensive. There are no cesspits for the privies.
10. There are lavatories, but at too great a distance from the hospital. The arrangements are the same as those for the barracks.
11. There are no baths.
12. Linen is washed by washermen, and is well done.
13. Most of the hospital stores are of sun-dried bricks, small and fragile, but tolerably dry.
14. The beds generally in use are wood, with mat bottoms. They are fragile, harbour vermin, and are constantly requiring repairs. Iron cots with sacking of canvass are in use at Cawnpore, and are found to answer well.
15. The hospital kitchens are those generally in use, where native cooks are employed. Although the cooking is satisfactorily done, it would be an improvement to introduce proper cooking stoves. Roasting and grinding of coffee are imperfectly done, on account of want of suitable apparatus.
17. The attendance on sick is ample. In a regiment 1,000 strong it consists of 1 apothecary 1 steward, 1 assistant apothecary, 3 hospital apprentices, 1 head compounder, 1 assistant ditto, 1 head dresser, 1 assistant ditto, 2 shop coolies, 1 native writer, 2 stewards' servants, 7 bheesties, 9 sweepers, 1 sirdar, and 20 ordinary ward coolies, 1 ayah, 1 methranee, 1 head and 4 ordinary cooks, 1 head and 4 ordinary washermen, 1 clothier, 2 tailors, 1 barber. These are permanent, but can be increased on emergency.

   Six European nurses have been allowed for Allahabad General Hospital since 1858, and have been found to add much to the comfort of the sick in that hospital. European nurses are not employed in any regimental hospital. European orderlies to attend to special cases are always available on application to the regimental authorities.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	18. The sanitary condition of the hospitals may be considered as good. Hospital gangrene or pyœmia has not occurred. Cholera, when epidemic, has occurred among the sick in several hospitals, but not in undue proportion. 19. The hospitals at Allahabad, being generally merely temporary barracks occupied as hospitals, are deficient in many requirements for regular hospitals. It would be useless to suggest improvements under existing circumstances. 20. Convalescents take exercise daily on elephants. A great want is felt in the hospital precincts not being defined, and being totally devoid of trees, shrubs, walks, or seats. 21. There is no separate hospital accommodation for the sick of soldiers' families. Wards in the hospitals are, however, set apart for them. In the general hospital there is a female ward, attended by European nurses, where sick women and children have every comfort. An ayah and methranee are allowed to each regimental hospital, for attendance on women and children. 23. As regards the powers of Medical Officers in their hospitals, all suggestions and representations made by them through their Commanding Officers meet with due attention as far as the exigencies of the service admit, from the Barrack Master and Executive Engineer. Change of diet and the issue of medical comforts, are strictly within the jurisdiction of the Medical Officer, at stations, in camp, and on the march. Extra diets and medical comforts are readily sanctioned by the Deputy Inspector-General on requisition, accompanied by an explanation as to the necessity. 24. There are no convalescent wards. The practice at the station is, that men on becoming convalescent are discharged from hospital, but attend daily for inspection by the Medical Officer; while they attend morning parade, they are exempt from all duty, until returned fit for duty.
XIII. Burial of the Dead.	1. There are two cemeteries for interment of troops, one north, the other west of cantonments. 2. The soil is Kunkur or calcareous clay, on a substratum of sand. Decomposition takes place readily. Grounds carefully kept. 3. The following rules for interments are in force at present. Graves to be 7 feet long, 2½ feet wide, and 5 feet deep. Two feet between the graves. No grave to be reopened for fresh interments, nor for other purposes, without permission of the Medical Officer. The time of burial is sunrise or sunset, as fixed by the Medical Officer. Burial takes place 12 to 18 hours after death. 4. The grave yards are never offensive. 5, 6. The dead of camp followers and bazaar people are burnt, or cast into the Ganges. No injury accrues from these practices. 7. The present rules and practices answer satisfactorily.

(Signed) Jno. Fordyce, Brigadier.
J. B. Dickson, Deputy Inspector-General of Hospitals.
Augustus Shelton, M.B., Surgeon, 48th Regt. (Secretary).
J. Fullarton Beatson, M.D., Surgeon, Bengal Army.
F. W. Peile, Captain, Engineers.

14th July 1860.

LUCKNOW, ROY BAREILLY, FYZABAD, GONDAH, AND SEETAPORE.

Accommodation:
- Queen's Troops: Artillery - 957; Cavalry - 591; Infantry - 4,681
- Native Troops: Artillery - 101 (Lascars.); Cavalry - 1,875; Infantry - 3,865

(Between 700 and 800 of these infantry are at Bareutch, close to Gondah. The above shows all the troops in Oude. There are no European troops at Bareutch.)

References to Subjects and Queries.	Replies.
I. Topography.	1 to 14. There are five principal military stations in Oude:—Lucknow, Roy Bareilly, Fyzabad, Gondah, and Seetapore. Lucknow, which is the largest, is situated in lat. 26° north, long. 81° east; Roy Bareilly is 49 miles to the south-east; Fyzabad 82 miles nearly due east; Gondah about 70 miles to the north-east; and Seetapore 53 miles a very little to the west of north. Around all the country is flat and cultivated. Irrigation is carried on chiefly by wells, but surface water, which collects in the rains, is also used for the purpose. The elevation of Lucknow above the level of the sea is 360 feet, Roy Bareilly and Fyzabad are, I imagine, very nearly the same height; Gondah and Seetapore are probably a few feet higher. They are all situated on the highest ground in their immediate vicinity. As a sanitary position I prefer the old Lucknow cantonment to that of the new one; the former was at Marion to the north of the city, the latter is at Dellkoosha to the south. On military grounds, and because it was thought that the present position would not prove unhealthy, the site was chosen by a committee appointed to decide on one in the beginning

LUCKNOW, &c. BENGAL.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	of 1859. The stations are all open and freely exposed to the winds, and at none, I believe, is the temperature raised by reflected sun heat. There are no important works of irrigation near any of the stations. The distance of Lucknow from the nearest hills is 100 miles; Roy Bareilly is between 40 and 50 miles farther off; that of Fyzabad may be about 70 miles off; Gondah 50 miles; and Seetapore 70 miles. The exact height of the Hymalayan range immediately to the north of Oude I do not know. Irrigation is not observed to have a marked effect upon the health of any of the above stations. Rice cultivation is not prohibited, but it is an article not very extensively grown in the province; and I believe there is no indigo grown near any of the stations referred to. There is not, I believe, any adjacent higher ground from which the drainage must necessarily pass into the subsoil of the station. At all there are some open tanks or ponds. The cantonment site at Lucknow was selected by a committee composed of the brigadier commanding, the civil commissioner, the chief engineer, the superintending surgeon, the assistant quartermaster-general, and the executive engineer, aided by a sub-committee of medical officers. Other cantonments were, I suppose, chosen by committees somewhat similarly constituted. The Lucknow committee considered the nature of the soil and subsoil, quality of the water, elevation, facilities for drainage, surface of the surrounding country, &c., and the health of the native population in the immediate neighbourhood was minutely inquired into. Lucknow is two miles from the cantonment; though smaller than formerly, it is still a large city, and is supposed to contain between 400,000 and 500,000 inhabitants. Roy Bareilly is a mile from the cantonment; Fyzabad about two; Gondah and Seetapore are each about a mile and a half. Fyzabad is a town of some pretensions, the other three are small. Lucknow stands on the small river Goomtee, which is from 40 to 50 yards wide in the dry season, but increases very considerably in the rains, sometimes overflowing its banks. The overflow seldom lasts long. The cantonments are situated to the south-east of the city, about two miles from the river, the ground upon which they stand being about 40 feet above the level of the latter. To the south-west, within about a mile and a half, there is a jheel of three-quarters of a mile in length, which enlarges considerably in the rainy season. It is fortunately out of the line of the prevailing winds. On the north they are bounded by a canal, which, except during the rains, contains but little water, and at that time it may almost be termed a running stream. A belt of trees stands between them and the native city. The soil is more or less sandy. Water is found about 35 feet from the surface, and in most of the wells it is good; in a few it is brackish. There are no jungles in the vicinity. The ground to the south-east of the Dragoon barracks is broken and full of ravines. As yet there has not been time to judge if this will have an injurious effect upon the health of the men. I may mention that the surgeon of the corps believes it to be a source of fever. The facilities for drainage are great, through ravines leading to the river in one direction, and the canal in the other. Roy Bareilly stands on the left bank of the Salree, a small stream which is nearly dry in summer, though navigable for small craft in the rains. Its banks are very much broken up by ravines in the neighbourhood. The soil is marly. Water generally good, at some spots containing nitre and common salt, and is found about 30 feet from the surface. Fyzabad is on the right bank of the Gograh, which during the rains is from two to three miles wide, and at other times from 600 to 800 yards. It is only when an inundation takes place that it is so wide as the first mentioned. The station is bounded on the north by the river, and on the west by a creek, which joins the river at both ends. This is filled with water in the rains, forming the land between it and the river into an island. A couple of months after the rains cease the greater part of the water dries up, leaving only a little remaining in about half a mile of it towards the northern end. The creek is altogether between three and four miles in length. There is, moreover, a tract of marshy ground in the west, which in the dry season is partially cultivated, and in the rains it is generally under water. The average height of the station is about 18 feet above high-water mark, and 30 feet above that of low water; it is tolerably well drained by two nullahs, which run on either side of the European barracks. There is reason to fear, however, that these nullahs serve as leaders to malaria from the marshy land in the neighbourhood. The station is a good deal wooded, but to the westward it is open to the evil influences of low ground by the river side. It has been proposed to plant a belt of trees along that boundary. The soil is alluvial; it consists at some parts of the surface of sandy clay, at others altogether of sand, and towards the west there is some limestone. Sand extends to the depth of upwards of 15 feet, below which it is clayey. Water is plentiful everywhere, and good, containing a small quantity of calcareous matter, and is found at a depth of about 20 feet. Gondah is to the north of the Gograh, about 30 miles to the north-west of Fyzabad, and 90 to the south-east of Seetapore. The surrounding country is flat, from 20 to 25 feet below the level of the cantonment, which stands on an elevated piece of ground. The plateau on which the troops are placed is separated from the country by a declivity of the height mentioned on all sides except the north, where it is continuous with a plain of about the same level. Half a mile to the south is a small stream, the Selivee Nuddee, which runs from the westward in an easterly direction, and empties itself into the Gograh near Fyzabad. The drainage of the station is excellent; all the surface water is carried off. A large drain cut in front of the European barracks leads to a nullah which communicates with the Nuddee. The banks of the stream are inundated during the rains, and the ground between it and the cantonment then and in the cold season is almost a swamp; that between the European barracks and the town is broken up by ravines, which contain more or less water in the rains, but are dry in the hot season. About two miles to the north there is a strip of jungle; small jheels and groves also exist in and about the station. The soil is sandy to the depth of about 20 feet, and then comes a bed of kunker. Water is abundant and good at about 20 feet from the surface. Seetapore stands on a plateau sloping on the west, south-west, and north-west sides towards the river Surain, about two miles distant. The height of the cantonment in the dry season is about 44 feet above the level of the river. There are several small jheels and groves about the station and in its neighbourhood, and the river banks are intersected by ravines, which give facilities for drainage. The soil is clayey, with a sandy subsoil, below which, at a depth of 24 or 25 feet from the surface, good water is found in abundance.

References to Subjects and Queries.	Replies.

II. Climate.

1. Until recently only the common thermometer has been available for meteorological observations in Oude, and consequently the annexed table is very incomplete.
2. Table of Meteorological Observations at Lucknow for two years, from 1st April 1858 to 31st March 1860 inclusive.

Months.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Rain, Inches.	Winds. Direction.	Winds. Force.	Remarks as to Cloud, Wind, Dew, &c.
Jan. 1859	64	76	51	—	Westerly.		Weather cool.
„ 1860	66½	79	54	—	Wly. & Ealy.		Cloudy, warm towards the close of the month.
Feb. 1859	66½	76	57	Showers.	S.W.	Strong.	Ditto.
„ 1860	68½	79	60	Heavy do.	N.W. & Wly.	Do.	Hail fell on the 24th.
Mar. 1859	74	86	62	Showers.	E. & Wly.	Do.	——
„ 1860	83½	92	75	—	E.S.E. & Wly.	Do.	Hot, frequent dust storms.
Apr. 1858	91	99	83	—	East winds.	Do.	Hot wind.
„ 1859	85	96	73	—	Ealy. & Wly.	Do.	——
May 1858	90	98	82	Slight drizzles.	Easterly.		Hot wind, cloudy, thunder and lightning.
„ 1859	91	102	80	Slight showers.	Do.		Hot wind, last half of month very hot.
June 1858	91	100	82	Slight rain.	Ealy. & Sthly.		Cloudy, thunder and lightning.
„ 1859	89	95½	82½	Heavy rain.	Ealy. & Wly.		Cloudy.
July 1858	87½	95	80	Do.	Easterly.		Cloudy, thunder and lightning.
„ 1859	87½	96	79	Frequent rain.	Do.		Ditto.
Aug. 1858	84	89	79	Rain.	Do.		Ditto.
„ 1859	84½	86	83	Rain.	Do.		Cloudy.
Sept. 1858	82½	84	81		Ealy. & Wly.		Mornings cool and dewy, days warm.
„ 1859	87	91	83		E.&W.&N.W.		Clear weather, mornings cool.
Oct. 1858	75	84	66		Ealy. & Wly.		Weather mild.
„ 1859	83	87	79		N.W.		Clear weather, cool mornings.
Nov. 1858	69	76	62		Westerly.		Days cool and nights foggy.
„ 1859	71	80	62		N.W.		Clear, cool weather.
Dec. 1858	62	67	57	Rain.	Westerly.		Cool weather.
„ 1859	58½	65	52	Slight rain.	N.Wly.		Ditto.

3 to 5. The climate of the provinces, as in most other parts of India, is divisible into the cold, hot, and rainy seasons. The cold weather sets in at the beginning of October, and is at its height in December, when the night temperature is low enough to freeze water. Ice is also made in January, and sometimes even so late as towards the end of February. The cold season ends in March. Heavy dew often falls in the winter months, and there are not unfrequently showers of rain. The hot weather sets in towards the end of April, and hot winds blow throughout May and June till the rains commence, which they commonly do at the end of the last-named month. During this season dust storms are frequent, and often very violent, and while it lasts the air in the day is more or less charged with fine dust. As a rule it subsides at night, to be raised again by wind in the day. The sun and wind increase in power up to the time the rains begin to fall; the wind is chiefly westerly at this period, at all events in the day; in the early part of the night it not unfrequently becomes easterly. The rains, as stated, commonly set in towards the end of June, preceded by storms, accompanied by lightning—slight at first, but heavy in July and August, and occasionally there is a cessation for a longish period. On such occasions the vegetation produced by the first falls dies away for want of water, and the sun's rays and future falls of rain, acting on the decaying vegetable matter, must no doubt produce malaria, which cannot but act injuriously on people who may happen to be massed in the neighbourhood. Irrigation, which is carried on throughout the province by wells, does not seem to influence the climate of stations. The climate of Oude is beyond doubt superior to that to the south of the Ganges, though not, perhaps, so dry. The temperature at most of the stations is lower; I judge it to be so from its influence on the health of the troops. The kind of diet, shelter, and clothing required are the same as in other parts of the Upper Provinces. The climate calls for no special precaution as to drills, duties, and exercises beyond what are elsewhere considered necessary. During 1859 and 1860 the stations have stood thus in point of salubrity, as shown by the returns of European troops occupying them:—1st, Roy Bareilly; 2nd, Gondah; 3rd, Seetapore; 4th, Lucknow; 5th, Fyzabad. Fyzabad and Gondah appear from native report to be more subject to epidemics than the others. The temperature trans-Gograh is considerably lower than on the Lucknow side of the river, and the atmosphere is said to be more humid; natives of that district are subject to goitre. At all the stations the most healthy months are those of the cold and hot seasons, and the most unhealthy those at the breaking up of the rains. This is especially the case at Fyzabad. Fevers prevail in the hot, rainy, and early parts of the cold season. In June the greatest number of cases occur; in January the least. Bowel affections there also occur and prevail chiefly during the hot and rainy seasons. The greatest number of cases occur in August; the least in January. Liver affections are common in August and September; fewest cases occur in January, February, and March. Cholera is very variable with regard to its period of prevalence. Sporadic cases take place all the year round, but occasionally it takes on an epidemic character. At the end of the rain in 1859 there was a slight epidemic, and again in the early part of the hot weather of 1860. Catarrhal affections are common in the cold season. Heat apoplexy occurs in May and June; in May, June, and July 1858 it was alarmingly common; in May alone upwards of 500 cases occurred in the Lucknow field force. I never heard before of its being so frequent.

III. Sanitary Condition of Station.

1 to 3. A general map or tracing of each station with the surrounding country has already been forwarded with each separate report, and as the Engineer Department have complained of

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	the difficulty of preparing duplicates on account of the pressure of work, the preparation of them has not been urged. The same may be said with regard to the barracks, &c. The dimensions of those at Lucknow are entered in the subjoined form; those at other stations are much the same. The infantry barracks are constructed for half a company, or 48 men; those for the artillery and cavalry for a troop or company. In all the barracks in Oude the cubic space per man is from 1,500 to 1,700 feet. Each barrack has a mess-room across the centre. 4. Table of Barrack Accommodation: Date of construction, commenced in February 1859. Total number of rooms or huts { 20 barracks for infantry, 9 for cavalry, when all are completed.

Barrack Rooms or Huts.	Regulation No. of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
					Ft.			Ft. in.		Ft. in.	Ft. in.
Infantry Barracks, each contain—											
Two Wards -	24 each.	72·6	22	23	36,685	1528·5	66·5	1 8	Doors in each, 12	7 6	4 1
									12 windows.	2 6	4 6
A Mess Room -	48	44	22	23	22,244	463·5	20·2	—	6 windows.	2 6	4 1
Cavalry Barracks, each contain—											
Four Wards -	18 each.	52	22	23	26,312	1644·5	72·5	1 8	8 windows.	2 0	4 1
A Mess Room -	72	46	30	23	31,740	440	19	—	6 doors	7 6	4 1
Four end or Serjeants' Wards, one at the corner of each Infantry and Cavalry Barrack - -	1	18	12	14	2,464	2,464	176	1 8	3 doors	7 6	4 1
Guard Rooms -	—	60·5	18	23	25,647	—	—	—	12 windows.	2 6	4 6
									14 doors	7 6	4 1
									In each Cell.		
Prison Cells - -	1	10	10	18	1,800	1,800	100	1 8	2 windows.	2 6	4 6
									2 windows.	4 6	4 6
									2 doors	7 6	4 6

some stations the cubic contents of each prison cell amount, I believe, to 2,000 feet.

5. In nearly all the barracks there are windows on both sides. In a few of the married barracks they are only on one side; they open on swivels by ropes; there is a verandah surrounding the barracks 10 feet in width; these verandahs are not used as sleeping quarters in any barrack in Oude. There are no jalousies or jhilmils in the barracks at Lucknow, nor, I believe, at other stations.
6. The bedsteads are of wood, with tape bottoms; the bedding consists of two sheets, a quilt, setringee, and a blanket. Iron bedsteads would be an improvement; those of wood are much infested with bugs.
7. Tents are constructed of cotton cloth, with a pole or poles generally of bamboo. The dimensions of a private's tent for 16 men are as follows:—height, 10 feet; ditto of walls, 5 feet; length, 20 feet; width, 17 feet; which gives 21 superficial and 159 cubic feet per man.
8. The barracks are ventilated by doors and windows, and by ventilators in the top of the pent in the roof; the guard-rooms are also ventilated by the same means; tents chiefly by four doors. This method is quite sufficient. Kuskus tatties, and punkahs have been hitherto the only available means for cooling the air in barrack-rooms at Oude. Thermantidotes have not yet been established.

9 and 10. The barracks are constructed principally of burnt bricks, laid in mud cement, with tiled roofs. The tents are of cotton cloth, wooden or bamboo poles, generally the latter, with cotton ropes. The floors are formed of large square bricks or tiles; they are 3 feet above the level, and there is no ventilation beneath them.

11. Barracks constructed as above are believed to be well suited to the climate. The same remark applies to tents. The Engineer Department attends to whatever repairs are requisite; but hitherto attention has been principally devoted to constructing and completing barracks in Oude. The senior medical officer at the station is the sanitary officer. Whitewashing of barracks (internally), hospital cells, privies, and guard-rooms is done annually; hospitals more frequently, when specially required.

12 and 13. The lavatories and cook-houses at Lucknow are constructed in the following manner, and those at other stations in a similar way:—In the lavatories there is a long shelf of masonry used for washing basins, which is open; also a set of small rooms where ablution can be performed in privacy. At each end of the basin-shelf there is a cistern, into which water is brought by pipes from a higher cistern at the nearest well. The water can be partly got rid of by an outlet at the top, and wholly through one at the bottom of the cistern, into an outside drain. A small canal runs along the whole length of the bath-room to supply water to the bathers, who can draw it in earthen gurrahs or leathern buckets, and throw it over themselves. Iron bars across the canal prevent the bathers from lying at full length in it, and thus soiling the whole supply of water. The supply and discharge of the water is

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	arranged similarly to that of the cisterns. The cook-houses are large rooms, in which the native construction of fireplace has been generally adopted. Cooking vessels, which are supplied by the Commissariat Department, are tinned twice a month; they consist of copper pots and pans; there are likewise frying-pans and gridirons. With respect to washing linen, it is done at the nearest stream by washermen, who cleanse it, and then dry it in the sun by hanging it on ropes supported by poles. The convenience for this purpose is quite sufficient. 14 and 15. Privies in Oude are constructed on the same principle as at other stations; the drainage is arranged for by a narrow drain running the length of the building, sloping uniformly from one end to the other; at the higher end is a water cistern; at the lower a cesspool. The water from the higher cistern scours the drain into the lower cistern or cesspool. At the back of each privy there is an opening through which the sweepers remove all solid matter; the ordure is carried off to a distance in night-carts. The ventilation of privies is through ventilating tiles at the ridge, doors, and openings near the top of the walls. There are no special arrangements for lighting; it is done by lanterns, with candles or oil-burners. The openings in the walls are trellised with bricks. 16. There is no sewering as yet constructed; the only drainage that has been provided being for rain or surface water, which is carried off into natural watercourses. There is no doubt the drainage will be sufficient when the building operations now in progress are completed. Facilities for drainage are great. The small end rooms in barracks and hospitals are said to be slightly damp; the same may be said of those in hospitals; those at Roy Bareilly, occupied by the Royal Artillery, are the only ones that are in any way affected; at other stations it is not so. The rain water is carried away by shallow surface drains, which are sufficient; the small quantity thrown out from barracks evaporates or sinks into the soil. Urine is received into tubs or reservoirs from which it is removed and carried to a distance in conservancy carts. The reservoirs (cesspits) are close to barracks and hospitals; they are emptied twice a-day by sweepers. Tubs are in most general use. The reservoirs are attached to privies, and are small. Wells for ablutionary purposes have been dug, or are about to be dug, at no great distance from them. It is proposed to have a pucka reservoir to each wash-house, into which all the water used shall run; when full, to be emptied by earthen or leathern vessels; the water being either sprinkled over the surface in the neighbourhood or conveyed to soldiers' gardens when near. There are no foul ditches which may be really termed as such, near any of the stations. 17. The surface cleansing is generally good; it is performed by regimental sweepers, under the orders of quartermasters. The refuse is removed to a distance beyond the cantonment by carts, sometimes once and at others twice a day. 18. The surface of the cantonment at Lucknow is kept perfectly free from vegetation, and I believe it is so at other stations. At some stations there are some old walls, but they will not exist when the present arrangements are completed. 19. The bazaars are only being formed; that at Lucknow is well laid out, with fine broad open streets; when completed it will be capable of perfect drainage. Cleanliness is attended to by sweepers. Latrines are provided for inhabitants and camp followers; sweepers clean the bazaars morning and evening. Native houses in the immediate neighbourhood of stations are kept tolerably clean. There are one or two pits in each village, from which the materials for building purposes have been dug out. There is no nuisance experienced in barracks from winds blowing over the native dwellings. 20. Animals are slaughtered for the use of the soldiers at Gondah, Roy Bareilly, and Fyzabad, half a mile; at Seetapore, one mile; at Lucknow, two miles. Offal is chiefly eaten by vultures; at Fyzabad it is partly thrown into the river. No nuisance is experienced. 21. Bazaar horses, and those of camp followers, are kept in the station, picketed either in the bazaar or in the neighbourhood of grass-cutters' huts. Troop stables are on raised grounds sloping, so as to ensure water running off. Manure is carried away, but is partly used in riding schools; at some stations in burning bricks; at others, removed to a distance and deposited on the ground. 22. At most of the stations the horses stand in the open air. At Gondah the stables consist of a tiled roof on framework supported on pillars; there are no walls; at the ridge, the roof is double for the purposes of ventilation. At some stations the stables or horse lines are in front of men's barracks at about 100 yards distance; at others, they are between the barracks and the officers' lines. No dung-heaps are allowed to form; manure is carted away to a distance; the picketing grounds are well removed from hospitals. 23. Separate quarters are provided for married men, each one being allowed two rooms, measuring, one 18 ft. by 12 ft., the other 12 ft. by 12 ft.
Officers' Quarters.	1. Officers do not live in Government quarters, but in private bungalows. When all arrangements for drainage are completed, the sanitary state will be good. There is no improvement to be mentioned upon that which is being already carried out.
IV. Health of the Troops.	1. The stations in Oude are generally healthy; Roy Bareilly and Gondah are particularly so, likewise Seetapore. Lucknow and Fyzabad are above the average of stations of the north-west provinces. The native population in the country are healthy. 2. Fevers of different types are prevalent among the native population; bowel complaints and liver affections are also frequent. Spleen exists, and is most common, I believe, about Fyzabad. Cholera epidemics also prevail at times to some extent. 3. The climate, together with good feeding, probably renders the people of Oude more healthy than those of other districts. 4. A large proportion of the troops in Oude came to India from home in 1857, and were in camp or in tents in 1858–9, and have been gradually getting into barracks at the different stations since. The health of all has improved during the past year. They have suffered from fever, liver and bowel complaints, cholera (though not to a great extent), and ophthalmia; venereal has also been common, generally one-fourth to one-third of all the European sick. At some stations some barracks are considered not quite so healthy as others, but I believe there is nothing very marked about any. 5. Troops are not camped out, excepting for a short time, when barracks are being white-washed or repaired. 6. I have never held charge of European troops at hill stations, though for a number of years I was attached to the stations of Simla and Nitogle. 7. Have not had the opportunity of judging on a large scale. From the experience I have

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	had, however, I should say that troops are not more liable to febrile attacks on returning to the plains. 8. I approve of hill stations for troops. 9. Diarrhœa is a disease which is very likely to attack troops upon going to the hills. On the other hand, I have seen persons suffering from that disease on arrival get rid of it in the hills. 10. No fault is to be found as regards diet, shelter, and duty at hill stations. Men, I believe, often injure themselves by insufficient clothing, and by taking violent exercise in valleys, shooting and butterfly catching, exposed to the hot rays of the sun. 11. By far the best season for residing in hill stations is the cold one. In order to enable our troops to receive the benefits of such residence it is necessary to stay from 20 to 22 months, or it may be two years, in which the whole of one cold season and about half of a second should be included. 12. I should say that no injury would accrue to any one who stayed beyond this term upon his returning to the plains for service. 13. Proper attention to clothing and avoiding the direct rays of the sun are the special precautions for protecting the health of the troops on leaving hill stations for the plains. The slanting rays of a forenoon sun are, I think, especially hurtful. 14. I would recommend giving the troops a short service in the plains and locating them in the hills. Frequent change is beneficial. 15. No experience. 16. From 6,000 to 8,000 feet or higher above the level of the sea would be the most suitable site for hill stations. 17. There is said to be a good site about 80 miles to the north of Seetapore viâ Luckimpore; but, so far as regards myself, I have no correct information regarding it. 18. A dry sandy surface with sandy subsoil has always been found to be the most healthy soil for stations. 19. The best age for soldiers to proceed to India would be at the age of about 20 years, when the constitution is pretty well formed; and they should land at the commencement of the cold season. In order to preserve the health of recruits upon first landing in India, I would not allow them to remain a single day at a presidency town if it could be avoided. I would send them to their regiment with the least possible delay. Care should be taken that they are clothed for the season, a head-dress being furnished fit to give thorough protection. Every precaution should be taken to keep liquor from them, and they should be warned against the immoderate use of fruit. 20. I would send troops direct from the home depôts, and on landing, to the northern parts of the country, afterwards to the hills, and latterly to Bengal. 21. Troops are sent by boats and river steamers, also by bullock train, marching is, I believe, the most healthy mode of sending them. 22. A British soldier should serve from 10 to 15 years in India. 23. Medical boards frequently are not unanimous in opinion; the majority decide as to the disposal of cases before them. I have no suggestions to offer. 24. The best time for invalids to leave India for home is February or the early part of March.
Diseases.	1. There are, I believe, regular inspection parades for the purpose of discovering any incipient disease in all European charges. The times for them vary in different corps. 2. There has not been, so far as I can remember, any case of scorbutic disease among the troops in Oude. The supply of vegetables is abundant, which may account for its absence. 3. The proportion of cases of hepatic disease varies greatly, according to the nature of the season, the amount of exposure the men are subjected to, &c. In Lucknow itself it was 4 per cent. in 1858; in 1859 it increased; and it was larger in 1860. Good shelter, wholesome food, healthy exercise and amusement, steady habits, and avoiding over-exposure to the sun would tend to diminish its frequency. 4. There has not, to my knowledge, been a case of dracunculus amongst the European troops in Oude for the last three years. 5. The proportion of venereal cases has been from one-quarter to one-third of the total sick. Women should all be under surveillance, and lock hospitals should be established; one has been established in Lucknow in connexion with the King's hospital there; it has generally from 40 to 60 inmates. Diseased women from regimental bazaars are taken into it for treatment. The city itself contains upwards of 1,200 registered prostitutes; and when the hospital becomes in perfect working order there is no doubt it will be more generally resorted to than at present. 6. The troops at the station suffer both from diseases of the epidemic and endemic class. Fevers of the intermittent, remittent, and continued forms are common at all the stations. The largest number of admissions from the disease takes place in the months of May, June, and July; the smallest in December, January, and February. Dysenteric cases are common, the largest number occurring in August, September, and October. Cholera has not been severe at any station in Oude during the past three years, nor has small-pox. The cases of this disease have, however, been more numerous than might have been expected. Rheumatism has been of pretty frequent occurrence. The following statement shows the total admissions and deaths, in the Lucknow field force, in the year 1858–9, and the proportion of admissions and deaths, from the above diseases to the whole :—

Total treated	23,478	Deaths	976
„ Fevers	9,491	„	211
„ Dysentery	2,105	„	323
„ Cholera	21	„	10
„ Small-pox	109	„	27
„ Rheumatism	534	„	1

7. The nosological character of the more frequent zymotic diseases may be briefly explained. Fever of various types, acute dysentery, diarrhœa, and cholera. These diseases are most prevalent in hot weather and rains, especially at the breaking up of the rains. At the time of their appearance the climate reaches a very high temperature, especially when combined with moisture in the air. As regards predisposing personal habits. Troops, from want of

References to Subjects and Queries.	Replies.
IV. Health of the Troops —Diseases—*cont.*	employment, are apt to go out of doors when they ought not to do so, and often give themselves up to dissipation and debauchery. 8. Over-work increases epidemic disease, and renders troops more liable to suffer from it. Strict discipline is conducive to health in barracks, on the march, and in the field. 9. Small doses of quinine have been used but little. In 6/14 Royal Artillery at Roy Bareilly it has been used with a satisfactory result. 10. In order to mitigate or prevent the ravages of epidemic disease at the station, I recommend the reduction of duties, as far as possibly can be done consistently with discipline, in the hot weather and rains; put restrictions on exposure; let the men use malt liquor freely instead of spirits; build good workshops, and provide the means of giving out-door amusements; encourage games, and attach a well-supplied reading-room to each corps.
V. Intemperance.	1. I have no reason to suppose that intemperance prevails to a marked extent in any corps or detachment in Oude. 2. Drunkenness *per se* is punished in all corps to the best of my knowledge. 3. Distilled spirits are sold in the canteen, not at the bazaar, each man having his allowance only. The quality is good. Spirits is everywhere considered a portion of the soldier's ration, if the soldier wishes it and is able to pay for it. Under ordinary circumstances it is never given in the morning; one or two drams in the day. Spirit is never given as a ration to convalescents, unless specially ordered by a medical officer; it is of good quality. At some stations ginger-beer is sold; nothing else injurious I believe. 4. As a rule, I believe the consumption of spirits is not conducive to health. 5. For the mass I believe it would be beneficial to abolish the use of spirituous liquors. In exceptional cases they are, no doubt, beneficial, and could ill be done without. 6. Malt liquor and wines are beyond doubt to be preferred to spirits. 7. Coffee and ginger-beer are used; not lemonade or soda-water. 8. I am quite satisfied it would be beneficial to suppress altogether the spirit ration, substituting beer, tea or coffee, &c. 9. It would be beneficial to prohibit the sale of spirits in the canteens, substituting beer, tea, coffee, lemonade, &c. 10. I recommend to arrange for the sale of beer, porter, tea, coffee, lemonade, &c., at a low rate, so that they may come within the soldier's means.
VI. Diet.	1. The composition of the ration is as follows:—Meat, 1 lb.; bread, 1 lb.; vegetables, 1 lb.; rice, 4 ozs.; salt, 1 oz.; sugar, 2½ ozs.; tea, $\frac{5}{7}$ oz., or double the quantity of coffee on alternate days. Rations are generally inspected by an orderly officer and quartermaster. 2. The troops receive three meals per day; first at 8 A.M., second at 1 P.M., and third at 5½ P.M., the first and last altered according to season. One lb. of vegetables enter into the constitution of the ration. The kinds of vegetables vary according to the season—potatoes, onions, cabbages, turnips, sweet potatoes, &c. &c. are used. 3. The present ration is excellent, more than enough, if no waste takes place; and yet some men pay for extra meat. Orderlies in some corps see to the safety of the rations, but men are more disposed to buy than to sell them. 4. The cooking apparatus consists of copper vessels, which are kept tinned, gridirons, frying pans, spits, kettles, &c. The kitchens are clean, light, and well ventilated, and sufficiently supplied with water. The meat is boiled, roasted, broiled, and fried. The cooking is properly done, and sufficiently varied. Tea and coffee are commonly well prepared. The men generally have refreshments before marching; coffee is the common beverage then. 5. Gardens could no doubt be advantageously established for the cultivation of vegetables; some are already in existence.
VII. Dress, Accoutrements, and Duties.	1. Cotton clothing is worn by troops here in the hot and rainy seasons; that now in use is well suited to the climate, as is also the present wicker helmet. Woollen clothing is used for cold weather.
Duties.	1. Men should be drilled at home, most certainly. 2. The usual routine of a soldier's duty consists in drills and guards; the former twice or thrice a day, according to the season. The men do not suffer in health from drill, if at proper hours. The length of time is from 1 hour to 1½. The best times for drills, parades, and marches is at sunrise and half an hour before sunset. I am not aware of any general order on the subject. The average number of nights the men have in bed during the week varies at different stations. Six, eight, or ten nights. 3. Guards are mounted close to barracks; no guard lasts longer than 24 hours. There are roll calls several times in 24 hours; I do not know how many. Night guards are prejudicial to health. Woollen clothing should be worn by the night guards, except at the hottest season. It may vary in thickness according to the time of year, but the texture should be of the kind stated.
VIII. Instruction and Recreation.	1. The means of instruction and recreation now being established consist of ball courts, skittle-grounds; schools, with good schoolmasters, library and reading-room, sufficiently lighted at night, day-room, or soldiers' clubs, soldiers' gardens, theatre, and gymnasia, all of which, except workshops, are in course of completion at Oude. When fairly established, they no doubt will keep the men occupied during the wet season and the heat of the day. In the hot months there are restrictions as to exposure to sun and rain out of barracks when off duty; at other times there are none, except as regards head-dress. The result is, I believe, favourable. 2. I suggest that workshops should be built. The means of recreation, when all arrangements are completed, will be ample. 3. I have no doubt the institution of soldiers' savings' banks would prove most advantageous. 4. There are clumps of trees at all the stations, or in the immediate neighbourhood, which give a good deal of shade, except perhaps at Gondah; but men in the hot months cannot go out in the day, even under the shelter of trees, without injury to health.
IX. Military Prisons.	1. Wherever military prisons have been completed, they are good, commodious, and well ventilated.

LUCKNOW, &c. BENGAL.

References to Subjects and Queries.	Replies.
X. FIELD SERVICE.	1. I know of no local regulations for field medical service which are not included in the General Presidency Regulations. 2. Excepting occasionally regarding camping grounds, medical officers are not called upon for an opinion, so far as my experience goes. 3. As a rule medical officers are not consulted in the selection of ground for camps; the selection is generally made by the quartermaster or quartermaster-general, when one is present. Objections or suggestions offered, however, by them to the ground chosen are commonly attended to. In standing camps drains are always cut; all nuisances are removed; no accumulations of filth are allowed to take place. Latrines are arranged for. Tents might, perhaps, be improved by having some means of ventilation at the ridge. Water supply is generally ample, brought by bheesties from wells. 4. Field hospitals are arranged for in accordance with the rules laid down in the Medical Regulations. Ambulance carts were allowed in the late campaign for the conveyance of sick, but were not generally approved of by medical officers; all were desirous of substituting the four for the two-wheeled conveyances; dhoolies were generally preferred. Hospital supplies are carried on camels and in country carts, sometimes on elephants.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No reply.
XII. HOSPITALS.	1 and 2. Plans have been submitted. All the hospitals are in the rear or flank of the barracks, distant from them from 150 yards to half a mile. They have been kept well clear of stables; and of the bazaar and houses belonging to the civil population. The sites of all are open and well ventilated. The dragoon hospital at Lucknow is not far from broken ground; the drainage will be good at all when completed; as yet it has not been properly arranged for. The ground on which the dragoon hospital stands is the best that was available, avoiding the windward of the stables. The river is some distance off; its banks are slightly marshy for a short time in the rains. The broken ground can be kept clean. The sites of all hospitals in the province are well elevated. 3. The supply of water at all the hospitals is abundant and wholesome. 4. All the drainage is surface drainage; there is no sewage. 5. The only wards that exist are raised three feet; there is no perflation of air beneath the floors. Water is carried away by surface drainage; part sinks into the subsoil and part evaporates. The surface drainage carries off the water, but at some parts, where the ground round the hospital is level, it does so slowly. The materials consist of burnt bricks laid in mud cement or lime cement; lime is used in the plinth. The walls are single, two feet thick; the roofs are tiled, and too thin, I think. There is a verandah on each side of all hospitals; the verandahs of the hospital 23 R. N. F. are 12 ft. wide, of all others only 10 feet. A 10-feet verandah is scarcely sufficient. No sick or convalescents are accommodated in the verandahs except in female hospitals, where they are double. All hospitals have only one flat. The dimensions of the wards in all hospitals are not the same. The wards of the 23rd R. N. Fusiliers' hospital are 24 feet in width; in all others at Lucknow, and most of those at out-stations, they are only 22 feet. The particulars of the 23rd hospital are entered in the following table:— Date of construction.—All hospitals in Oude were commenced in 1859. Total number of wards.—The number of wards varies from 2 to 10, according as the hospital is for a battery of artillery, a cavalry or an infantry corps. Total regulation number of beds.—Sixteen in each ward.

Wards or Hospital Huts. No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Doors in each Ward.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
										Feet.	Feet.
Two Wings, Five Wards in each Four End Rooms, One at each Corner	16	50	24	24	43,800	2737·5	75	1·8	8	7½	4½
	1	20	14	17	4,760	4,760	250	1·8	3	7½	4½

All hospitals in Oude are placed so as to receive the benefit of the prevailing winds. Windows are up near the top of the wall, and open, as in barracks, on centre pivots, and are moved by ropes. The arrangement is very conducive to ventilation and coolness. Wooden shades are necessary to the latter.

6. The wards are ventilated by doors and windows, and a double roof, or ventilating tiles at the ridge. Ground ventilation by holes in the doors. There are no jalousies or jhilmils.
7. The air is cooled by watered kuskus tatties. Thermantidotes have not been brought into general use in Oude yet.
8. There are no means of warming necessary. The ceilings and walls are cleansed and lime-washed once a year regularly; oftener under special circumstances.
9. The privy arrangements are similar to those for barracks. In the whole of the hospitals, except the 23rd R. N. F., the privies are, I think, too close to the main building. The supply of water has not yet been very large. If sufficient water is used, they will be well drained, by which I mean largely used. They are not over cesspits. If sweepers are not allowed to neglect them, they are not offensive.
10. With respect to the lavatory arrangements, there is a small room to each ward of the hospital; in some rooms no arrangements are made; the patients wash in tubs, or earthen vessels placed there without arrangement; in others there is a shelf of masonry, on which washing vessels are placed; and in a few, one or two baths of masonry have been constructed.
11. In a few hospitals there are, as stated, one or two pucka baths; in the washhouses, earthen gurrahs, wooden tubs, and one or two hip-baths. In each hospital there are one or two iron or wooden tubs for warm baths. The means are not more than sufficient, perhaps barely so.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	12. The linen is washed by washermen at the nearest stream, and dried on ropes supported by poles; quite sufficient. 13. The storage is dry and quite sufficient. 14. The cots are of wood, tape bottoms; the tape an inch and a half and two inches in width; a quilt and one or two blankets, one large and two small pillows, a pair of sheets and pillow-cases. The supply is ample, as also the personal linen. Iron cots would be an improvement on the present wooden ones. A mattress also should have been named. 15. The kitchens or cook-rooms are much the same as those in barracks, generally about 40 yards from the hospital; cooking utensils are much the same; the cooking is good, and sufficiently varied. 16. The tables of dietary and other returns are laid down in the Medical Regulations. 17. Establishments for attending the sick in this country are native. There is one hospital serjeant. For cases requiring special care the services of comrades from the barracks are obtained; they are excused from all other duties. With their help in such cases, the attendance is sufficient. 18. The state of the hospitals in Oude is good. The hospital of the 2nd dragoon guards at Lucknow, with broken ground near it, is not so well placed as others. The position, however, I do not consider bad, and the broken ground in the neighbourhood can be improved. 19. Larger and better bathing houses would be an improvement. 20. No gardens or walks have been made in the neighbourhood of hospitals in Oude at present. Patients take exercise in the verandahs, or just outside the building; they go out also on elephants for air. 21. Female hospitals are provided, with two female servants attached. The arrangements are quite satisfactory. 22. There are no special local hospital regulations, as far as I know, at any of the stations. 23. Recommendations of medical officers are, as a rule, attended to. Hitherto, from heavy press of work, there has been not unfrequently some difficulty in carrying out repairs and alterations at once. All works in Oude are new, and the pressure has as yet been great. Medical officers have quite a sufficiency of changes of diet at their command. The supply of medical comforts has always been most liberal, both in camp and in quarters, and on the march. 24. There is no hospital for convalescents at any station in Oude. Medical officers arrange their wards in the regimental hospital as is thought best. For a few cases it might be advantageous to place them in a convalescent hospital until fit for duty. With a commodious well-regulated regimental hospital, however, such an arrangement would hardly be necessary.
XIII. Burial of the Dead.	1. Burial grounds at the various stations are from a quarter to one mile from the cantonments. They are out of the line of prevailing winds. 2. The area contains from 1½ to 2 acres or more, avoiding a rigid station; that at Roy Bareilly is 1½ acres; the Lucknow one is considerably larger. The soil and subsoil vary at different stations. The best spots have been chosen at each, and they are carefully kept. 3. The regulations as to burial are as follows:—The grave space allowed, 6 to 7½ ft. by from 2 to 3 ft.; from 2 to 3 feet between each grave. The depth of grave is from 6 to 8 ft. Never as yet have any of them been reopened. There is no compulsory time after death for the interment, but it commonly takes place within 24 hours, often in 12; during epidemics within 12 hours. The dead of native troops are disposed of according to caste. Mahomedans bury outside the cantonments, also a few Hindoos; others burn their dead, or throw them into the nearest stream. I have no information with regard to the rules followed where the dead are disposed of by burial. 4. No graveyards in Oude up to the present time have proved offensive. As regards the regulation of burials of British soldiers, a death report is sent by the surgeon to the adjutant of the corps, and also to the chaplain. A grave is at once dug, and the body is conveyed to it in a dhooly, after having been placed in a coffin, which is followed by a funeral party told off for the purpose. Funerals take place in the morning or evening. 5. The dead of camp followers and bazaar people are disposed of in the following manner:—Mussulmen are buried; Hindoos either burn their dead or throw them into the stream. 6, 7. No injury accrues to the public health from the present practice, but I believe that the best plan would be to burn all bodies at some distance from the cantonment.

A separate copy of this report for each station in Oude has been filled up by the commanding officer, the engineer, and medical officer of the station. I have filled up the whole of this myself, and therefore I alone sign it.

(Signed) J. Campbell Brown,
Deputy Inspector-General of Hospitals.

1st January 1861.

DELHI.

Accommodation:
- Queen's Troops: Artillery - 127; Infantry - 832
- Native Troops: Artillery - 26; Cavalry - 505; Infantry - 877

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is uncultivated, the ground being very rocky and much cut up with ravines. It is in general flat and dry; a low ridge running from N.W. to S.E. about a mile or more from the station. The general aspect on this side is dry and sandy, but on the other side of the ridge there is much swampy ground; there is also some little jungle and a good deal of wood.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	2. The elevation of the station above the sea is 800 feet. It is about the same level as the surrounding country. The nearest water is the river Jumna, which flows beneath the walls, and the Western Jumna canal, running through the city. The nearest actual marsh is the Nuzufgurh jheel, 15 miles off, but during the rains there are many smaller jheels much nearer, but none, however, on this side of the ridge. There is no higher or healthier ground adjoining the station. 3. The nearest mountains to the station are the Himalayas, the foot of which is 100 miles off; the nearest hills are the Dadpoottras, which die out at Delhi itself; and the nearest table-land is that of Central India, distant 100 miles. 4. The vicinity of the station is not liable to overflow of water, but there is a portion of ground under the palace walls, a mile or so wide, which is generally overflowed by the Jumna for a few days in each rainy season. The ruins of old Delhi are about a mile from the city. The ground all about there is being much broken, but without prejudice to the health of the inhabitants. 5. The station is not well ventilated, and, being inside the walls of the city, the temperature is raised by exposure to reflected sun heat. The usual hot winds blow every year, but they do not affect the health prejudicially. 6. The country surrounding the station is uncultivated for a space of two miles, and the surrounding country beyond that distance is irrigated by the Western Jumna canal, which runs through the city, and also by the Eastern Jumna canal. I have not observed that artificial irrigation has any effect on the health of the station. The cultivation of rice is prohibited within a distance of three miles, and there are no indigo works near. 7, 8. Part of the present station was the former cantonment for the troops after the first taking of Delhi in 1803. A large portion of the city has since been levelled to form an extended cantonment. 9. With regard to the depth below the surface at which water is usually found, it depends upon the height of the ground above the level of the water in the river; but the average depth is, say, 30 feet. 10. The rain-fall and water from surface springs in this district flow readily off, either sinking into the sandy soil, or else running off along the surface; there is also the drainage of the ridge, which, however, does not affect the subsoil of the station. 11. The greater part of the water supply is derived from the river, and the rest from wells; and, with but few exceptions, the well water is brackish. There is no store of water, there being only one large tank at Delhi, the Ellenborough tank, which is dry about 1½ months out of 12, and contains neither plants nor animals. Some of the wells are shaded with trees, but they are in such constant use, that any impurity is detected, and measures taken to remove the cause. There is no nuisance or malaria proceeding from any tank affecting the present station. 12. The water supply is not good, the well water having a slight quantity of soda in solution, and being mostly brackish. The purer wells have carbonate of soda in small quantities. I cannot say that the water is very injurious to health. The wells are worked in the usual manner, by "motes" and "dolchees." A reservoir for the water, to be drawn from the main stream of the Jumna, at its second rise in August, would afford purer water. 13. The retreat of the Jumna in September leaves considerable pools of water to the south-east of the city, and when the wind blows in that direction before these are dry, it causes a heavy vapour, which however, in the absence of vegetable deposit, is not unwholesome, and only of rare occurrence. 14. No reply to this query.
II. CLIMATE.	1. The means and instruments available at the station for conducting and registering meteorological observations are a rain gauge and a common thermometer. 2. No meteorological table can be prepared, as all records were lost during the rebellion.

MEAN TEMPERATURE within the City Walls, from observations extending over a period of Three Years.

Months.	Mean Temperature.	Remarks as to Cloud, Dew, Wind, Storms, &c.
January	56	The rains commence usually at the end of June, and last, with many intermissions, until the end of September, and sometimes later. The quantity varies much, and in some seasons is as low as 10 inches. From November to April (the cold season), the prevailing wind is from the west, but in the rains from the south-east. Hot winds and dust storms prevail during the months of April, May, and June, the hot wind sometimes blowing day and night, and generally from the west.
February	61	
March	72	
April	83	
May	91	
June	92	
July	86	
August	83	
September	83	
October	77	
November	65	
December	58	

3. The climate is unusually dry, the prevailing wind being from the west, and blowing over a sandy and rocky soil; the presence of the river tends but little to modify this throughout the year; but the trees in the city tend to the purification of the air, by the absorption of carbonic acid. The canal irrigation does not act prejudicially upon the salubrity of the city. The sand wafted by the air, during the months of April, May, and June, is injurious chiefly to the eyes. Taking into account the facility for dissipation which a large city offers to British troops occupying it, the city of Delhi seems to possess a climate favourable to the constitution of Europeans, and unusually favourable to that of native troops. The most unhealthy part of the year is September and October for the natives, and, to a certain extent, for Europeans, the prevailing disease being a low fever.
4. There is no district in the neighbourhood of Delhi healthier than the city site.
5. No reply to this query.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station.	1, 2, 3, 4. None of the questions regarding this station can be answered, as nothing has been decided on or sanctioned; and many of the questions are such as could only be answered after barracks, &c., had been built, and had stood the test of several years; whereas, at present, there are no barracks at Delhi. 5 to 8. The temporary barrack rooms are kept cool by "punkahs," or large fans, suspended from the ceiling, and pulled by coolies, two of whom will keep a punkah in motion the whole night. Each coolie gets 4 rupees, or 8*s.*, a month. In April and May kuskus tatties, which are frameworks of bamboo, with the kuskus (a fibrous root) spread equally over them, are also used; these are fixed in the doorways, and kept constantly wet by coolies, who receive the same pay as those for pulling the punkahs; and the hot westerly wind blowing through them, effectually cools the room. The cost of a punkah is about 10 rupees, and a *tattie* 4 rupees. 9 to 12. No replies to these queries. 13. With regard to the convenience for washing and drying linen, each person keeps his own washerman; and a certain number are attached to each regiment. 14 to 16. There are no foul ditches near the station. 17. The surface cleansing of the cantonment is done by the conservancy establishment daily, the refuse and manure being carried down to the river. 18. The surface of the cantonment is kept entirely free from vegetation, and clearances, as recommended, are being carried on. 19. A sudder bazaar is being established. As the station adjoins the native city of Delhi, no dung-heaps or cesspits are permitted; nor is any nuisance experienced from wind blowing over native dwellings. 20. Animals are slaughtered outside the city, some miles from the men's quarters, and no nuisance is experienced from the offal. 21. Officers' horses are kept in stables in their own compounds, and the manure conveyed to a distance. 22. There are no stables or barracks. The artillery horses are picketed three-quarters of a mile from the temporary hospital, the men being located in a mosque on a higher elevation than the horses' picketing ground. 23. There being no barracks, married men reside in separate quarters.
Officers' Quarters.	1. There are no regular officers' quarters.
IV. Health of the Troops.	1, 2. The station is generally healthy, and so also is the native population; the most prevalent diseases among the natives are fever, spleen, ulcers, and smallpox. 3. The health of the neighbouring native population may, I think, at the present time, be attributed to the small quantity of rain which has fallen in this district for the last two years. When the country is much inundated by heavy rain, the people are said to suffer much upon its drying up. The people in the surrounding districts are said in some places to be dying of starvation, in consequence of the scarcity and dearness of food, caused by the want of rain. Ulcers, which are very prevalent in this district, are supposed to be caused by the water, which contains many different salts. Some of the water has been sent to the chemical examiner to Government for analysis. 4. Her Majesty's 88th Regiment were marching about the country at Cawnpore, Calpee, and Oude before arriving at Delhi, which station they reached in March 1859; the diseases they chiefly suffered from before arriving at Delhi were fever and dysentery, and since, from fever, venereal diseases, and ulcers peculiar to Delhi. The Artillery is composed of men who have come from different stations; some few have been at Delhi during and since the siege. 50 were volunteers from the 88th Regiment, and about 50 were men who arrived from Meerut, in December 1858; they have suffered since arrival at Delhi, from fever, hepatitis, venereal disease, and ulcers. No portion of the men's accommodation at this station is more unhealthy than the rest. 5. The troops at this station are never camped out. 6, 7, 8. I have never been in charge of troops at a hill station, but judging from the benefit I have myself received from a residence in the hills on sick leave, and also from men and officers whom I have often seen, who have also been restored to health by visiting the hills, I approve of the selection of such stations for troops. 9, 10. Troops proceeding to hill stations are sometimes liable to attacks of diarrhœa, and I do not know of any precautions which could be taken to enable them to obtain greater benefit from a residence there. 11. The months of March, April, May, September, October, and November, are the best adapted for residence at hill stations. I do not know what is the shortest period of residence which would enable troops to obtain the full benefit of such residence, it would depend upon the nature of the disease that each individual might happen to suffer from. 12. I do not know that the health of the troops is liable to injury on returning to service in the plains, but to the generality of people a residence in the hills for a long period is beneficial. 13. No special precautions are required to protect the health of the troops on leaving hill stations for the plains. 14. As a general rule, it is certainly preferable, and most conducive to the health of troops serving in India, to locate them on hill stations, with short periods of service in the plains; and frequent change of station in the plains is also beneficial to the health and spirits of troops and convalescents. 15. There is not sufficient accommodation for convalescents at any of the hill stations, owing to the large increase of European troops in Bengal within the last three years. 16. No experience. 17. There is no higher ground near, which could be advantageously occupied as a hill station. 18. I have not found any particular class of surface and subsoil more healthy or unhealthy for stations than others. 19. The best age for soldiers proceeding to India is about 20 years, and the best period for landing there is the month of November. Troops for Bengal and the north-west land at Calcutta, and go into barracks either in Fort William or Barrackpore, and are rapidly sent up country by bullock train to join their regiments. Troops for the Punjab and at Kurrachee, where there is a depôt and excellent barracks for recruits, who, for the preservation

DELHI. BENGAL.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	of their health, should, on first landing, avoid exposure to the sun, and excess in eating and drinking, and also too long and frequent parades; and should also wear hats and clothing suited to the climate and season of the year. 20. Troops should be sent direct from the home depôts to India, and on landing should join their regiments at once, wherever the regiment may be. Regiments on first arrival would be much benefited by going to the hills for a year. 21. Troops proceed from Calcutta by rail and bullock train to Cawnpore. From Kurrachee they proceed by river steamer to Mooltan. No additional precautions are necessary for preserving their health on the route. 22. British soldiers should serve in India 10 years, after which they should have the option of returning home. 23. I believe the business of medical boards is generally conducted so as to avoid conflict of opinion as regards invaliding, but I think there should not be more than two medical officers at most from the same regiment on the same committee. 24. The month of January is the best time of the year for invalids to leave India for home.
Diseases.	1. Inspection parades for the discovery of incipient diseases are held weekly in the 88th regiment, but not in the artillery. 2. Scorbutic disease does not occur at this station. 3. The proportion of cases of hepatic disease usually under treatment, is 3 cases per month out of 850 men of H.M.'s 88th Regiment, and $1\frac{1}{6}$ cases per month of the Bengal Artillery of 130 strength; in the year 1859–60 there were 5 fatal cases in the artillery; this disease is caused chiefly by climate, by excess in eating and drinking, and by exposure to the sun and night air. The prophylatic measures are avoidance of excess and exposure, and exercise for the body and mind. 4. No cases of dracunculus have occurred among the European troops, and very few among the natives. 5. The proportion of constantly sick from venereal disease to the total sick in hospital is about one third; the establishment of lock hospitals would be advantageous, and the women of the bazaar might be registered and inspected. 6. The troops at this station suffer from diseases of the endemic class, such as intermittent, remittent, and continued fevers, acute and chronic dysentery, and occasionally hæmorrhagic; cholera has not appeared lately, but in 1857 this disease prevailed during the siege outside and within the city walls. There have been a few cases of small-pox amongst the Europeans and native troops during the present hot season, and rheumatism also occurs. The proportion which admissions and deaths from these diseases bear to the total admissions and deaths is as follows:—in fever cases, admissions one-third, and deaths one-seventh; dysentery, admissions $\frac{1}{38}$th, deaths one-third; cholera, admissions 2 only during the year, deaths, one; small-pox, admissions 3 in the year, deaths 1; rheumatism, admissions $\frac{1}{20}$th, and no deaths. 7. The cases of fever have a tendency to be accompanied by head and low typhoid symptoms, and the dysentery by hæmorrhagic, and hepatic disease to terminate in abscess. Ulcers are of a peculiar character and very difficult to cure, disfiguring the face dreadfully and giving the nose occasionally a cauliflower appearence. Such diseases are most prevalent during the months of May, June, July, September, October, and November; and the climatic and atmospheric conditions which precede or accompany their appearance are, great heat in the three former months, and considerable alteration of temperature, and malaria in September and October. The buildings in the city are very much crowded in some places, and the streets are generally narrow and badly ventilated. The conditions which appear to predispose to these diseases are, exposure and night duty amongst the troops, and poverty among the natives, such as bad houses or huts, and insufficient food and clothing. 8. Troops stationed either in barracks or standing camp are much more liable to epidemic diseases than when marching or actively employed in the field, this is not caused so much by the habits of the soldier as by the monotony of his life, and the impure air consequent upon a large number of men being crowded together. Officers are not much affected by epidemics. 9. Small doses of quinine have not been tried at this station as a prophylactic against malarial disease, except in one case, that of a serjeant of artillery who was subject to fever, and in his case the exhibition of quinine was attended with decided benefit. 10. For the prevention or mitigation of epidemic disease at this station strict attention should be paid to the sanitary condition of the station and barracks, and to the isolation of affected patients.
V. INTEMPERANCE.	1. The soldiers at this station are inclined to be temperate, about four men per company in the 88th Regiment being confirmed drunkards, and in the Artillery several men drink to excess. 2. The proportion of admissions into hospital from diseases caused directly and indirectly from intemperance is unknown, and I have no data to go by to prepare a table showing the effects of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station. Drunkenness *per se* is punished as an offence. 3. Distilled spirits are sold at the canteens, but every precaution is taken to prevent their being sold in the bazaars. The spirit used is rum, mixed with about one-fourth of water, and about three-fourths of the soldiers take one dram, and one-fourth two drams per day. Spirit forms no part of the ration, either of soldiers or convalescents, nor is rum issued from the canteen before 12 o'clock at noon. No drinks injurious to health, other than intoxicating drinks, are sold at the canteen or bazaar. 4. The consumption of *spirits* by troops and convalescents is injurious to health, but as men *will* drink the issue of a small quantity is conducive to contentment, and content leads to good conduct, and good conduct to good discipline. 5. Spirituous liquors are not issued as a ration, but I think it would not be advisable to abolish the sale of it at the canteen. 6. A moderate quantity of malt liquor or good wine is wholesome and good for the health. Spirituous liquors are injurious. 7, 8. Coffee, tea, lemonade, &c. are much used at the station, and their influence on health, efficiency, &c., as compared with spirits and malt liquors, is good, but it would not be beneficial to suppress the spirit ration altogether.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	9. I do not think it would be beneficial to prohibit the sale of spirituous liquors in the canteens, as, if they could not be procured there, the country liquor would be more sought after. 10. I have no recommendations to make on these points. 11. No reply to this query.
VI. Diet.	1. The composition of the ration for Queen's British troops, and European troops in the Indian army, is as follows:—1 lb. of bread, 1 lb. of meat, 4 oz. of rice, 2½ oz. of sugar, ⅘ oz. of tea, 1 oz. of salt, 1 lb. of vegetables, and 3 lbs. of firewood; beef being issued five times a week and mutton twice. Potatoes are issued whenever they can be procured, but during the months of June and July onions and pumpkins are given to the troops, as potatoes cannot be got. There is a responsible inspection of the constituents of the ration made by the quartermasters and orderly officers of the regiment daily, and by the commanding officers frequently. 2. A complete ration is provided for the troops without any deduction from their pay. A soldier generally has his breakfast of bread and tea at 8 o'clock a.m., dinner of bread and meat at 1 o'clock p.m., and his evening meal of bread and tea at 6 o'clock p.m. This is from the Government ration, but, in addition, soldiers generally have a little meat or a couple of eggs for breakfast purchased by themselves. The proportion of vegetables in the constitution of the ration is one-third. 3. If it were possible to issue potatoes throughout the year it would be an improvement. The men cannot dispose of their rations. 4. There is a cook-house for each company of a regiment, and each company is provided with cooking pots by Government, and the food cooked by natives. The kitchens at Delhi are only temporary. The food is sometimes boiled and sometimes roasted, and the cooking is properly done, and tea and coffee are properly prepared. The men have no refreshment before a march; it is customary to have coffee in the middle of a march. The cooks are sent on over night, and select a convenient spot about half way. On a regiment arriving at the coffee place, the arms are piled, the men fall out, and the regiment generally halts for half an hour. 5. Soldiers' gardens could not be advantageously established at present, but arrangements will be made for them in the new barracks when built.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress and accoutrements at this station are, in summer, khakee clothing, a helmet of wicker-work, a pouch belt, and bayonet belt; in winter, a red tunic and cloth trousers. I would much prefer white clothing to the present khakee, except for service, and I would suggest, as improvements in the dress, a suit of flannel for the rainy season, and a waterproof cape, to be worn when exposed to the rain. The present guard dress is the uniform of the season, cloth in winter, and great coats when cold enough at night; in summer, or the hot months, light clothing. Europeans are never exposed to the sun on guard in the day-time.
Duties.	1. The men being thoroughly drilled at home would not obviate the necessity of keeping up the drill in this country, and occupation of any kind is beneficial to their health. 2. The men do not suffer from drill. They parade for exercise every morning in the cold weather, and are out about an hour and a half. Their duties consist of the ordinary regimental guards. The first hours of daylight in the morning, and the last in the evening, are the best for drill. There are no general orders respecting these; it depends on the season of the year. The average number of nights the men have in bed during the week is five. 3. There are no regular barracks, but guards are mounted as near their temporary quarters as possible. There are roll-calls by day and night. The men do not suffer in health from night guards, nor are any additional precautions requisite.
VIII. Instruction and Recreation.	1. The means of instruction and recreation at this station are skittle grounds, schools, and a library and reading room, which are sufficient to keep the men occupied during the wet season and heat of the day. In the hot season, soldiers off duty are confined to barracks during the heat of the day, which is of great advantage to their health. 2. At present, I can suggest no improvements with reference to the means of recreation and employment for the men. 3. Soldiers' savings banks are in existence, and are of great advantage to the men. 4. There is not sufficient shade from trees or other means to enable the men to take exercise during the day without injury to health.
IX. Military Prisons.	1. These buildings are all temporary.
X. Field Service. XI. Statistics of Sickness and Mortality.	No information under these heads.
XII. Hospitals.	1, 2. There are no regular hospitals built. 3. The water supply is abundant, but the Delhi water is impregnated with saline salts. 4. The drainage is good, and is discharged into the river outside the ramparts. 5, 6. There is no regular hospital. The roof water is chiefly carried off by the drains. The temporary hospital is built of bricks, stones, and mortar. The roofs and walls are high, and no ventilation between them; but they are sufficiently thick to keep the hospital as cool as other houses at Delhi. It is supplied with temporary verandahs on both sides, which have not been used for the accommodation of the sick or convalescents, but would be if necessary. The hospital consists of one flat only, and is too much surrounded by other buildings and walls to receive the full benefit of prevailing winds. The doors serve as windows as well as doors. There are also ventilators made in the walls at the side and joining the roof. In some of the buildings occupied as hospitals there are skylights. The wards are ventilated by the doors and openings in the walls and roof, and the construction of the jalousies or jhilmils is as usual. 7, 8. The air admitted into the wards is cooled by means of tatties or punkahs, and the wards are warmed by means of fireplaces with wood fires. The walls and ceilings of the wards are cleansed and limewashed every six months. 9. The privies are within a few yards of the hospitals, and built of masonry. They are kept clean by sweepers employed for the purpose, and also by charcoal and lime being supplied abundantly twice a day.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	10. There are washhouses for lavatory purposes attached to the hospitals. 11. The means of bathing provided for the sick are iron and wooden baths. 12. Dhobies paid by Government wash and dry the linen excellently. 13. The storage is dry and sufficient. 14. The cots in use in the hospital are made of wood and webbing, but I think iron would be better, on account of the bugs which harbour in the wood. 15. The cooking apparatus is of the most simple kind, consisting of copper stew pans tinned, a spit, and a frying pan. The diets are pretty well cooked, and the cooks make simple puddings with tolerable skill. 17. There is a hospital serjeant to each hospital, but no nurses. Orderlies are allowed in any dangerous case that may require great care, and ward coolies are allowed in proportion to the number of sick. These men are generally attentive, and in ordinary cases quite sufficient, but I think two or three good matrons attached to each European hospital would be desirable. 18. The sanitary condition of the temporary hospital is good. No epidemic, gangrene, or pyæmia have appeared. 19. No reply to this query. 20. Some of the convalescents go out morning and evening on elephants provided by the commissariat. Occasionally, men who are very weak are sent out in doolies, but as only two doolies are allowed to a regiment, but few can avail themselves of this mode of conveyance. There are no shaded walks and seats set apart for their use. 21. The 88th Regiment have lately had a building put in order as a hospital for the sick wives and children of the soldiers of the regiment; but the Artillery have none, and are attended at their own barracks. The present arrangements are all temporary, as other barracks and hospitals are proposed to be built inside the palace. 22. There are no local hospital regulations enforced at this station. 23. The sanitary state of the temporary hospital is under the care of the medical officer, who may change the diet and give any medical comforts, such as wine, beer, &c., as he may consider necessary; but the expenditure of wine should not, according to the regulations, exceed one measure and one-fifth per patient daily without explanation. Repairs are done by the barrack master, on the requisition of the medical officer. 24. There are no convalescent wards nor hospital for convalescents at this station, but such accommodation would be very advantageous.
XIII. Burial of the Dead.	1, 2. The burial ground for British troops is just outside the walls of the city, and about half a mile from the fort. It is on the north, and therefore well away from the prevailing wind. Its area is about six acres. The soil sandy, with a rocky subsoil. It is well kept and well drained, as it stands on a ridge or rocky knoll of ground. 3. There are no particular regulations about graveyards here. The graves are never reopened, and seldom more than one body interred in the same grave. In the hot weather and during epidemics, interment is compulsory within 24 hours after death. There are no regular burial grounds for natives. 4. No complaints have ever been made as to any nuisance emanating from the burial ground, and as it is a new one, and there have been so few interments, it is not likely to become offensive. 5. The dead of the camp followers or bazaar people are burnt, buried, or thrown into the Jumna, according to their creed or race, or according to the disease which causes death. 6, 7. No injury to the public health accrues from the present practice, nor can I suggest any improvements in the way of regulation or otherwise in the burial or disposal of the dead.

(Signed) W. G. Brown, Brigadier Commanding.
C. J. Campbell, Captain, Executive Engineer.
R. H. Oakley, Surgeon, Artillery.

Delhi, 15th June 1860.

BENARES.

Accommodation — Queen's Troops — Artillery - - 188; Cavalry - - 256; Infantry - - 933. Native Troops — Infantry - - 750.

References to Subjects and Queries.	Replies.
I. Topography.	1. Benares is situated on the left bank of the Ganges, in lat. 25° 17′, long. 83° 4′. The river here forms a fine sweep, and the city stands on the external side of the curve, which is the more elevated shore, the river being about 30 feet below the level of the houses. The military cantonments are at Secrole, three miles west of the city. The country surrounding the station is flat or gently undulating, and well cultivated, the elevations being few and trifling, and formed of "kunkur," which in localities appears on the surface. The small Burna river forms the westward boundary of the station, and divides the latter from the civil lines, which are situate north-west of cantonments. There are several tanks, jheels, and low-lying fields in the neighbourhood where water lodges after heavy rains. No jungle exists in the vicinity, but the country is very agreeably diversified with mango, tamarand, neem, and other large trees, affording shade to the villages, and forming avenues along the principal roads. 2. The elevation of the station above the sea is estimated at 270 feet, but it is on a level with the adjacent country, which probably nowhere has a greater elevation above the sea than 300 feet. There is no higher or healthier ground near the station. 3. The Hill Fort of Rhotasgurh is on the nearest higher ground. It is on the left bank of the "Soane" 104 miles south-east from Benares and 24 miles from the station of Deheree on

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	the Grand Trunk Road. The hill is about 1,000 feet above the plain, and the table land on the summit is five miles long and four miles broad; but the surface is either too dry and rocky, or marshy where the water is collected in hollows. The heat at night is reported to be greater at the top of the hill than on the plain below, and the locality is considered insalubrious, and unfit for a cantonment. 4. The small stream of the Burna, where it approaches nearest, is less than a mile from cantonments. It is about 30 yards broad, winds between the civil and military stations, and debouches into the Ganges a short distance below Benares. Its deep channel gives the great advantage of a perfect means of drainage, but with the inseparable inconvenience of ravines. It has been the practice to throw an embankment across its bed annually after the cessation of the rains, so as to retain a depth of about 15 feet of water at the Burna bridge, the surplus water being allowed to escape by a side cut. This measure directly mitigates the heat and malaria which would otherwise be occasioned by the dry surface and damp and decomposing subsoil of the bed of the stream. The large body of water thus retained, and its constant fluctuation under the action of the alternately prevailing winds, prevent any general putrefaction of the water. The level of the embanked stream is about 20 feet above the low-water level of the Ganges. Notwithstanding the general purity of this large reservoir of water, its banks in the vicinity of villages and of this station become from the habits of the natives liable to offensive contamination. The level of the cantonments being high, they are not subject to inundations, and heavy rain readily escapes along the natural lines of drainage. On the east side of the parade ground is a deep irregular excavation, from which bricks were dug for the brick-works closed two years since. During the rains it is filled with water, which dries up after several months, and while this process is going on malaria is probably generated. The excavation might be partially filled up, deepened, and converted into a tank. On the west side of the cantonments the ground has been cut up by the periodical rains into a tortuous ravine, which passes close to the hospitals and forms the main line of drainage into the Burna river. During the greater part of the year the bed of this ravine or nullah is dry and generally kept free from filth and weeds, and in the rains the water only lodges in a few irregular hollows, of which the edges might be levelled, or cuts made where necessary, to prevent the water from stagnating. 5. The station is open, but its external ventilation s somewhat impeded by the proximity of the large city of Benares and its suburbs, and by a row of huts forming a bazaar east of the mint. The internal ventilation is much obstructed by the large Sudder bazaar in the centre of the station, close to and directly to windward of the European barracks. The direction of the principal streets in this bazaar is north and south, so that the westerly wind, which is the prevailing one, is impeded. This overgrown bazaar was recommended to be entirely removed to another site by a committee on 2nd May 1860, of which the major-general of the division was president; but Government has declined to sanction the expense which would be incurred by the proposed sanitary measure. The buildings being on a level with the ground, the surface of which is of a light colour and generally dry except during the rains, a considerable degree of reflected heat is unavoidable. The station is not exposed to cold or variable winds. The prevailing winds are east and west, the latter being the more prevalent throughout the year; sudden vicissitudes are rare, and have not been observed to have any appreciable effect in the health of the station. 6. The entire surrounding country is well cultivated, there are no works of irrigation near the station, and the fields are irrigated, in the usual native mode, from wells. This is not observed to have any effect on the health of the station. Rice is not cultivated in the vicinity of the station, and very little in the district. No rules exist forbidding its cultivation beyond the limits of the station, but it is presumed that all objectionable cultivation would be prohibited by Government on due representation by a sanitary committee through the commanding officer. A good deal of hemp is cultivated in the surrounding country, but not within four miles of cantonments. No injury to health accrues. 7. The city of Benares and its suburbs (together containing a population of 186,000) lie between the Ganges and the military cantonments. The length of the city along the left bank of the river is three miles, and its average depth one mile. The suburbs contain extensive gardens, with high walls, and bazaars line the road leading from the city to the cantonments. 8. The soil may be said to consist of an upper surface of light coloured argillaceous earth, interspersed with and resting on kunkur (or calcareous conglomerate), which forms deep beds, and appears also on the surface in localities, forming the small elevations which occur throughout the district. Benares has been a military station for many years past, the present European barracks having been built on the site of the lines of the three Native regiments which occupied the station previous to the mutiny in 1857. 9. Water is usually found at an average depth of 45 feet below the surface during the dry, and 25 feet in the rainy season. 10. The heaviest falls of rain flow readily away by the natural lines of drainage except at a few places at the south side of the parade ground, where the rain lodges, and forms shallow pools of water, which dry up by evaporation. There are also three or four hollows, or old excavations, in the officers' compounds, which get filled with water during the rains and slowly dry up. These have been repeatedly reported on by sanitary committees, but there appears to be difficulty in compelling the proprietors of the compounds to go to the expense of filling up the excavations or hollows in question. There is no higher ground the drainage from which must necessarily pass into the subsoil of the station. 11. The water supply of the station is derived from numerous wells. There are tanks in the vicinity, but no water for drinking purposes is stored in them. They are full during the rainy season, but nearly dry in the cold weather. These tanks contain one or two species of algæ, with suspended infusoria, minute fragments of vegetable matter, and some small species of fish. Tank water is not used by Europeans either for drinking or bathing, but the natives use it for the latter purpose. The mouth of each well is surrounded by puckah masonry, which prevents leaves and other impurities falling into it. There are three tanks in the vicinity of the barracks, which receive the surface drainage, and although two of them are enclosed to prevent contamination as much as possible, yet they must all be regarded as nuisances, and give out malaria when undergoing the process of evaporation. The third and most objectionable tank is in the centre of the bazaar, and emits very offensive effluvia when its stagnant contents are nearly dried up. These tanks ought to be filled up, but

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References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	more especially the one in the bazaar. The expense which would be incurred is the only difficulty in effecting so desirable a measure. 12. The supply of water for all purposes is abundant. Wells at convenient distances and also in every officer's compound. The water is clear and fine, without taste or smell. It is soft and pure, and contains a very slight trace of lime, chlorides in large proportion, and a slight quantity of potash, combined with carbonic acid. Means for correct analysis are not at hand, but the quality of the water appears to be good, and has not any injurious effect on health. The supply is ample. The water is drawn from the wells by native water-carriers, with leathern buckets; no better supply is required. 13. The above queries being very complete, nothing else requires to be remarked. 14. By Government General Orders, dated Fort William, 16th November 1858, it was directed "that in order to ensure a sufficient knowledge of the locality, the commissioner of the division, or deputy commissioner of the district, shall in future be placed on all committees assembled for the purpose of selecting new sites for cantonments, forts, &c. Such committees to be composed of two military officers, two medical officers, one civil officer or military officer in civil employ, and the executive engineer will attend the committee and render assistance. Any member of the committee who may dissent from the selection of a site or sites agreed to by the majority will record his opinion to that effect, and the reasons for it." If the above orders be carefully attended to, and the two medical officers selected for the duty be men of experience, no improvements can be suggested.
II. CLIMATE.	1. Thermometers are supplied by Government to every hospital. Under charge of the civil surgeon of Benares was also a barometer and a rain gauge. The barometer having got deranged, was sent to Calcutta to be adjusted, and has not been returned. Several medical officers are also supplied with aneroid barometers. 2. Table of two years Meteorological Observations from January 1858 to December 1859.

Months.	Barometer. Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain, Inches.	Winds. Direction. W.	Winds. Direction. E.	Winds. Force.	Days of Sunshine.	Remarks.
										Days.	Days.			
January -	29·852	65·4	13·3	73·0	59·7.	65·55	55·67	89·9	1·18	28	3			Total amount of rain fall in 1858, 30·0 in.; in 1859, 44·5 in.
February -	29·784	69·0	8·6	73·5	64·8	68·60	59·96	96·5	·10	13	15			
March -	29·695	75·5	7·2	78·4	71·2	84·03	67·56	101·7	·05	28	3			
April -	29·609	86·1	7·7	88·0	80·3	90·65	71·70	118·0	·30	25	5			
May -	29·427	92·2	11·0	98·8	87·8	90·44	79·26	127·5	—	16	15			
June -	29·407	91·0	4·5	89·6	85·1	101·26	82·66	114·0	8·88	16	14			
July -	29·405	87·3	1·6	87·1	85·5	85·93	85·03	116·1	6·74	14	17			
August -	29·441	83·8	3·1	83·3	80·2	84·88	82·28	109·8	5·85	15	16			
September	29·510	85·6	5·0	86·0	81·0	85·18	81·95	113·8	11·16	10	20			
October -	29·671	79·3	3·8	81·3	77·5	79·24	76·50	116·2	1·96	23	8			
November	29·850	69·6	6·6	73·7	67·1	72·64	65·57	109·1	·99	24	6			
December	29·884	67·1	9·7	68·2	58·5	63·11	58·12	92·3	·12	25	6			

The above table has been compiled from the copies of the meteorological registers kept by the civil surgeon at Benares.

3. The climate of Benares, like its geographical position, is intermediate between that of Bengal and the North-western Provinces. The cold is less intense, and the heat less scorching than that of the North-west Provinces, and it is much drier than Bengal. It is not subject to sudden change of temperature, but there are considerable diurnal alternations, especially at the commencement of the cold season. There is but little tree planting; no canal irrigation, or irrigation of any kind to influence the climate generally. The atmosphere is generally loaded with dust during the hot westerly winds, but the climate may be said on the whole to be salubrious. The diet during the hot season ought to consist of a smaller proportion of animal food than in the cold weather. The clothing used by the troops is always suitable to the season—woollen during the cold weather and drill or other light materials during the hot season. The most healthy months are from November to March, and the most unhealthy from August to October, when the diseases most prevalent are malarious fevers, dysentery, and hepatitis.

4. There is no district near Benares the climate of which is more conducive to health than that of this station.

5. The following is a list of the stations at which I have served:—Agra, Kurnaul (Sukkur, Hydrabad, and Kurrachee, in Scinde), Moulmein, Thyetmew in Upper Pegu, Ghazeepore, and Canton. The following is the order of their comparative salubrity:—Kurnaul, Kurrachee, Moulmein, Agra, Thyetmew, Ghazeepore, Canton, Hydrabad, and Sukkur. Kurnaul 24 years ago was a very healthy station, previous to the extension of canal irrigation for the cultivation of rice. Kurrachee enjoys a constant sea breeze, and with the exception of a fearful outbreak of cholera in 1846 is comparatively healthy; so is Moulmein, Agra, and Thyetmew. Ghazeepore has of late years been very unhealthy. Canton is comparatively cool, and were the troops properly sheltered from malaria, might prove much healthier than it did when the writer served there in 1858–59. The stations of Hydrabad and Sukkur in Upper Scinde are excessively hot and debilitating to Europeans, the long-continued heat being unmitigated by any rainy season.

III. SANITARY CONDITION OF STATION.

1, 2, 3. Map of the station, district, and surrounding country, and plan of the barracks are transmitted. The drains are all open ditches, except in the vicinity of the cook-houses, privies, and wash-houses, where they are constructed of brick laid in mortar, and plastered with lime plaster.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	4. Table of Barrack Accommodation. Date of construction, August 1858. Total number of rooms or huts, 14. Total regulation number of non-commissioned officers and men - - - - - - 7 companies of infantry and one troop of horse artillery.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per per Man.	Superficial Area in Feet per Man.	Height of Men's Beds above the Floor.
		Length.	Breadth.	Height.	Cubic Contents.			
		Ft. In.	Ft.	Ft.			Ft.	Ft.
No. 1 -	180	672 0	22	16	236,544	1,312	82	2
„ 2 -	82	336 0	22	16	118,272	1,440	90	2
„ 3 -	38	154 5	22	16	20,394	1,432	89·5	2
„ 4 -	40	103 0	53	16	87,344	2,184	136·5	2
„ 5 -	44	174 5	22	16	61,424	1,400	87	2
„ 6 -	90	220 0	43	16	151,360	1,680	105	2
„ 7* -	200							
„ 8 -	60	258 0	18	16	74,304	1,240	77·5	2
„ 9 -	90	180 0	39	16	112,320	1,248	78	2
„ 10 -	26 families	336 0	22	16	100,672	3,872	242	2
„ 11 -	26 families	336 0	22	16	100,672	3,872	242	2
Canteen, serjeant's mess, and school-room.		336 0	22	16	118,272	—	—	—
Orderly room - -	—	43 0	22	16	15,136	—	—	—
Guard room - -	—	96 0	22	16	33,792	—	—	—
Prison cells - -	8	6 0	10	18	1,080	1,080	60	—

* This is a building belonging to the Rajah of Benares, and it is only temporarily occupied, and is not suitable for a barrack being divided into several small rooms, which afford sufficient accommodation for 200 men.

5. There are no windows, but double doors, which are on opposite sides. There are also verandahs all round the barracks, 10 feet wide, but these ought not to be occupied as sleeping quarters. There are jalousies and jhilmils in some of the barracks, but not in all.
6. The bedsteads used in barracks are generally formed of wooden frames and iron hoop bands; others having cord lacing. Iron cots with cross-bands of iron are by far the best. Each soldier's bedding consists of two cotton sheets, one cotton quilt of double chintz, and one double country blanket. I would suggest that good English blankets be supplied to the troops, as is done in the colonies.
7. The European private's tent is formed of three layers of cotton cloth, and is of the following dimensions:—18 feet broad, 22 feet long, average height 8 feet, the walls being 5½ feet, centre of tent 10 feet in height, and the cubic contents 3,168 feet. Each tent is intended to contain 16 men, affording nearly 200 cubic feet of space, and a superficial area of 25 feet per man. There are four doors to each tent.
8. The barracks and guard-rooms have roof ventilation, and an ample number of doors, which admit as much air as is required. The means in use here are sufficient to keep the air pure by night as well as by day. During the hot season punkahs and tatties are supplied. A punkah is a large fan hung from the roof, and kept swinging to agitate the air. During the hot westerly winds the barracks are provided with kus-kus tatties, which are light bamboo frames, to which are fastened the roots of a fragrant grass. They are placed in the doors and windows, and are kept constantly wetted by bheesties and coolies. The sudden evaporation of the water cools the hot air, which passes into the room moist and cool. Each tattie costs about four rupees. The pay of a bheestie is five rupees per mensem, and that of a coolie four rupees. One bheestie is allowed to every three tatties, and one coolie to every two. About 20 tatties are required for one barrack of 100 men.
9. The barracks are constructed of sun-dried bricks and mortar. The tents are made of three layers of cotton cloth. There are no huts at this station.
10. The floors are constructed of Chunam stone, laid in mortar. As a rule they are not raised, but in some barracks they are two feet above the ground. There is no perflation of air, however, beneath them.
11. The materials of which the barracks, tents, &c. are constructed are quite suitable to the climate, only thatched roofs to the barracks would be better and cooler than tiled ones. The barracks and cantonments are kept in repair by the executive engineer. The walls and ceilings of the barracks are cleansed and lime-washed annually, or when reported to be necessary by the medical officer.
12. A wash-house is built for every company, supplied with water from a neighbouring well, and drained by a branch drain. There is one plunge bath, which is used both by the infantry and artillery; another is required.
13. The food is cooked by native servants in brazen pots provided for the purpose, and which are kept properly tinned by the commissariat. Water is supplied by regimental bheesties or native water-carriers, and the refuse water is carried off by a branch drain. All linen is washed by native washermen.
14. The privies are not drained, but the contents are received into a cesspool, and removed in a filth-cart morning and evening.
15. The buildings are mostly ventilated at the roof, and are lighted by the doors during the day and by lanterns at night.

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	16. There is no sewerage at all. The barracks are built irregularly and at various distances from each other. No building used as a barrack or hospital at this station can be said to be damp. The drainage is tolerably efficient. It is received into cesspools, and carried off by the conservancy establishment. These cesspools are 2½ feet in diameter, and 2 feet deep; they are close to the privies and wash-houses, 30 yards from the nearest well, but only a few yards from the barracks and hospitals. They are cleaned by sweepers twice a day or oftener if required. The filth is removed in a conservancy cart morning and evening. I am not aware that there are any foul ditches near the station. 17. Two conservancy carts, with an establishment of two domes and two sweepers, go round the station every morning, and collect all rubbish and filth from the roads, ditches, and compounds. This refuse is carted out of the station and thrown into some excavations made near the old government brick-kilns. The surface cleansing of the cantonments is efficiently performed. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c., interfering with the free ventilation of the station or bazaar, &c. 19. There is a conservancy establishment, consisting of sweepers and filth carts, for the purpose of removing all rubbish and filth from the bazaar, which is kept tolerably clean, though many of the huts in rear of the principal streets are much crowded. The bazaar is well drained, and there is one large latrine in the centre under the supervision of the police, for the accommodation of the women, children, and sick. The men go to another public necessary built near the baths. It is the bazaar-serjeant's duty to go round the bazaar every morning to see that the drains are kept clean and all refuse taken away in the filth carts. There seems nothing to be desired to improve the sanitary police. The native dwellings near the station are kept clean and in good order, cesspits and dungheaps being prohibited. No nuisance is complained of in barracks from wind blowing over the native dwellings. 20. The slaughter-houses are within the limits of the cantonment, at the north-east corner, and well out of the range of the prevailing winds. The conservancy carts visit these places morning and evening to carry away the offal, &c., and the butchers are enjoined, under penalties, to use lime and charcoal to keep the place free from all effluvia. No nuisance is experienced in the station from these slaughter-houses, so long as vigilance is exercised in keeping them free from all filthy accumulation; though the immediate vicinity is unpleasant, and a substantial building with paved flooring and modern improvements is doubtless wanted. The lieutenant-governor of the North-west Province has just sanctioned an advance from the Government Treasury for building on the plan of the slaughter-house at Meerut, and as soon as a suitable site can be fixed upon, it will be begun. 21. The horses of camp followers are not allowed to be picketed in the bazaar, but no arrangements are made to have them at any appointed spot. There is a "burdasht khanah" for travellers' and other cattle, and the manure is daily removed and sold, the profits arising from which serve to defray the expenses incurred in repairs to the buildings. 22. The artillery stables are open sheds with roof ventilation; they are about 100 yards east of the barracks, and one mile from the hospital. The litter is generally used to make the lunges. The cavalry horses are picketed in column of troops about 100 yards south of the nearest barrack, and about 400 yards south of the hospital, the prevailing winds being east and west. 23. There is sufficient accommodation in the married men's barracks for all the families.
Officers' Quarters.	1. Officers at this station live in detached bungalows, the drainage and ventilation of which are good. No improvements are to be suggested.
IV. HEALTH OF THE TROOPS.	1. The station, surrounding district, and adjoining native population are generally healthy. 2. The most prevalent diseases among the native population are malarious fevers, affections of the spleen and bowels; and epidemics of small-pox, caused by the practice of inoculation, are common in February and March. 3. I attribute the healthiness to the dryness of the climate, the absence of much marshy ground, the general condition of the population, who have a sufficiency of food and clothing and the efficient sanitary police regulations enforced by the magistrate in the city. 4. The 19th regiment came to Benares from Dinapore, where they had been stationed 15 months. They marched from Dinapore on the 20th February 1860, and arrived here on the 12th March. The health of the regiment had been very indifferent at the former station, where they had suffered from intermittent fevers and scurvy. During the march they improved very much, and since their arrival at Benares the prevalent diseases have been fevers and venereal affections. There is no portion of the men's present accommodation more unhealthy than the rest. 5. During the cold weather a detachment is generally encamped a few miles from Benares, at rifle practice, and with very beneficial effects to the health of the men. 6, 7, 8. I have never been in charge of troops at hill stations. 9. Hill diarrhœa is a disease peculiar to hill stations. 10. The diet and clothing of troops at hill stations are believed to be suitable to the climate, and the principal precaution required is that the troops should have sufficient barrack accommodation. 11. The hot and rainy months are those best adapted for a residence at hill stations, and in order to obtain the full benefit of such residence, troops should reside in the hills for at least one year. 12. There is no period of residence in hill stations beyond which injury is likely to be inflicted on the health of troops on their return to service in the plains. 13. The troops ought to leave the hills for the plains at a proper season; that is, at the commencement of the cold weather. 14. I have had no experience to enable me to reply to this query in full, but I consider frequent change of station in the plains decidedly beneficial to health. 15, 16. No replies to these queries. 17. There is no higher ground near this station which could be advantageously occupied as a hill station. 18. All authorities agree that the proper site for an Indian station is a perfectly clear open space, free from marsh, forest, or low jungle, perfectly isolated, at as great a distance as other than sanitary considerations will admit of from the native town and its own bazaars, and separated from all dense jungle and rice cultivation by a zone at least two miles in breadth.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	The situation should be sufficiently raised to allow of free surface drainage in every direction. See Dr. Norman Chevers on the means of preserving the health of European soldiers in India. 19. Soldiers should not be sent to India under 20 years of age, and recruits ought to be well-formed soldiers before they are sent out. In the hot season our hospitals are filled chiefly with young recruits. Troops ought to land in India in the cold season; that is, between the 1st of November and the end of February. It is very desirable that they should arrive early in the season, in order that they may be sent up country and arrive at their destinations before the setting in of the hot weather. Troops on first landing here are quartered in the barracks at Dum Dum, Barrackpore, and Chinsurah, where the accommodation is very good, and are treated there as is usual with recruits learning their duty; or they are sent off by bullock train or river steamer to join their respective regiments up country. In order to preserve the health of recruits on first landing in India, I would recommend that all unnecessary exposure to the sun be avoided, and due attention paid to the clothing and diet of the men. 20. Troops should be sent direct from the home depôts to India at a favourable season of the year. I would recommend that troops on first landing in India be sent at first to some of the healthiest stations in the plains. 21. Troops are sent from Calcutta up country by bullock train, in parties of about 100 men each. They travel during the night, and are accommodated during the day in roadside barracks, situated about 30 miles distant from each other. Others are sent by the river Ganges as far as Allahabad in troop boats towed by steamers. The only additional precaution I would suggest is that troops should not be despatched from their stations after the 15th March, when the hot season commences. 22. A British soldier should not serve longer in India than 10 years. 23. No fault can be found with the manner of conducting the business of invaliding boards. 24. Invalids proceeding home from India should leave from the 15th of December to the end of February.
Diseases.	1. There is a regular inspection parade for the discovery of incipient diseases at this station once a week. 2. There has been no case of scorbutus at this station. 3. The proportion of cases of hepatic disease usually under treatment at this station is seven per cent. of the sick. It is caused chiefly by the great diurnal alternations of temperature during the hot and rainy seasons, and is not generally consequent on other diseases. The best prophylactic measures are temperance, attention to clothing, and non-exposure to night air. 4. Cases of dracunculus are unknown in this district. 5. The proportion of cases of venereal diseases constantly under treatment to the total sick in hospital from all other diseases is 23 per cent. I would suggest that all prostitutes be turned out of the bazaars, and that there should be at every station a native hospital for the treatment of diseases of every description, and where diseased women would also be admitted. A lock hospital is open to the objection of its being necessary to adopt with it a system of supervision of bazaar women, thereby licensing prostitution, which it is doubtful if Government would sanction. 6. The principal diseases from which the troops at this station suffer are as follow, viz.:— *Fevers.*—Intermittent and remittent in the proportion of 31 per cent. to the total admissions; and the mortality is 13 per cent. to the total deaths. *Dysentery.*—Usually of an acute form in the proportion of 6 per cent. to total admissions; and mortality of 17 per cent. to total deaths. *Cholera.*—0·5 per cent. to total admissions; mortality 17 per cent. to total deaths. *Rheumatism.*—2·3 per cent. to total admissions; no deaths. 7. The more frequent zymotic diseases are fevers, chiefly of malarious origin, and syphilis in its various forms. The former are generally mild in character, and rarely assume the typhoid type. These diseases are most prevalent in the hot and rainy seasons, particularly towards the end of the rains in September. A high temperature, combined with moisture in the rainy season, and great dry heat, with still states of the atmosphere, are the climatic and atmospheric conditions accompanying the appearance of the above diseases. There is no one part of the station or city more unhealthy than another. The crowded and badly-ventilated dwellings occupied by the native population may predispose them to these diseases. 8. The soldier is not injuriously influenced as regards epidemic disease by the nature of his duties or occupations either in barracks or on the march. 9. Small doses have not been given as a prophylactic against malarial disease at this station. 10. I have no recommendations to offer on any of the preceding points.
V. Intemperance.	1. The soldiers at this station are on the whole temperate, and there are no confirmed drunkards among them. 2. In the 1st battalion, 19th regiment it is reported that only seven men were admitted last year from the direct effects of intemperance, and the diseases of five were clearly traceable to its indirect effects. There are no total abstinence men, neither is there a temperance society in the 19th regiment, there are therefore no data from which to prepare a statistical table showing the effect of total abstinence, temperance, and drunkenness, on the amount of sickness and mortality, and crime at the station. Drunkenness is always punished as an offence. 3. Distilled spirits are allowed to be sold only in the canteens. Each man is allowed to purchase two drams of rum of good quality per diem. During the last year the average quantity consumed by each man has been about half a dram of rum and half a pint of malt liquor daily. Spirit does not now form part of the soldiers' daily ration, neither is it ever given as a ration to convalescents. No drinks other than intoxicating drinks are sold in the canteen or bazaar. 4. The consumption of spirit by troops and convalescents is certainly injurious to health, and it is generally admitted to be the great cause of sickness and crime in a regiment. 5 Spirits do not form part of the soldiers' ration at this station, and it would be beneficial to the health of troops to abolish its sale in canteens. Its sale is prohibited in the bazaars. 6. Malt liquor of good quality is now supplied at the canteens, and its use is unquestionably beneficial to the health of troops, as compared with that of spirits.

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	7. Coffee, tea, lemonade, soda water, and similar drinks are much used at this station. They are sold at the canteen and at coffee shops in the Sudder bazaar, and their influence on health, efficiency, and discipline, as compared with spirits and malt liquor, is most decidedly beneficial. 8, 9. It would be beneficial to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, coffee, tea, lemonade, &c. to be sold to the troops. 10. I have no recommendations to make on these points. 11. There are no printed bazaar regulations regarding the sale of spirits, but none is allowed to be sold in this cantonment to soldiers at all. Venders of British and foreign spirits are bound down by the restrictions of the Abkaree Act of 1856, No. xxi. For the canteen rules see Bengal Military Regulations, Section x., page 47.
VI. DIET.	1. The ration for Queen's British troops and European troops in the Indian army is the same, and is composed as follows; viz.;—bread 1 lb., meat 1 lb., vegetables 1 lb., rice 4 oz., sugar $2\frac{1}{2}$ oz., salt 1 oz., tea $\frac{5}{7}$ oz., or coffee $1\frac{3}{4}$ oz., and firewood 4 lbs. The vegetables are changed according to the season, and beef is supplied six times a week, and mutton once. The rations are daily inspected by the quartermaster and officer of the day. 2. A complete ration, including a due proportion of vegetables, is provided for the troops, the stoppage for which is three annas and four pie (equal to 5*d.*) daily. The soldier takes three meals a day; viz., at 8 a.m., 1 p.m., and 5 p.m. Breakfast consists of bread, a little meat, and tea. Dinner of meat, vegetables, and rice, cooked according to his desire; and supper of bread and tea. The men generally supplement their rations by the purchase of milk, butter, and such other articles as they may fancy. The proportion of vegetables which enters into the composition of the ration is upwards of two-thirds. 3. The salt might be reduced one half and other condiments allowed in its place, and during the hot months it might be a beneficial change to issue mutton twice instead of once a week, as at present. The rations for each mess are placed in charge of its messmen, and are not liable to be disposed of. 4. The rations are cooked by native servants in copper boilers, large and small, and in stew-pans. The cooking utensils are carefully tinned twice a month. The kitchens are generally clean, light, and well ventilated, and amply supplied with water by native water carriers. The food is cooked in the manner desired by the men, and is properly done and sufficiently varied. The troops have coffee before a march. 5. There is a soldiers' garden near the barracks; but the men do not take much interest in it.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress at this station consists in the hot and rainy seasons of a khakee suit of light cloth, basket helmet covered with calico, and a light turban, with flannel and calico underclothing. In the cold season, of a serge coat, cloth pantaloons, forage cap, and flannel and calico underclothing. I consider this dress as quite suitable to the climate, and for the soldiers' duties both by day and night, and at different seasons. A great coat additional is allowed in the cold and rainy seasons, and the sentries are permitted to use verandahs or sheds for protection from sun and rain. I have no improvements to suggest.
Duties.	1. It is most desirable that men should be thoroughly drilled at home before being sent to India. 2. In the cold season the men are drilled morning and evening for an hour each time, and in the hot and rainy weather occasional parades of short duration take place, which tend to keep the troops in health. Drills, parades, and marches always take place in the cool of the morning and evening during the hot weather, and at any hour except between 10 a.m. and 3 p.m. in the cold season. The average number of nights the men at this station have in bed during the week is four. 3. Guards are mounted close to the barracks, and while most last 24 hours some are only of 12 hours' duration. There are four roll-calls during the day but none after tattoo. The night duties are light and not prejudicial to the health of the men.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation at this station. There is one ball court, three skittle grounds, two schools with good schoolmasters, one library and reading room, sufficiently lighted at night, one day room, one soldiers' garden managed chiefly by the regimental quartermaster, two workshops, and a station theatre used by the men. There are no gymnasia. These means are scarcely sufficient to keep the men occupied in the wet season and during the heat of the day. The men are confined to barracks during the hot and rainy seasons from 8 a.m. to half past 5 p.m., and with the very best effect on their health. 2. In order to increase the efficiency of the existing means of recreation and employment, I would suggest the erection of more workships and also of gymnasia. 3. Soldiers' savings' banks have been established in every regiment by Government orders, and must be advantageous. 4. There is not sufficient shade from trees, sheds, verandahs, or other means to enable the men to take exercise without injury to health during the day.
X. MILITARY PRISONS.	1. The cells at this station are too small, and are badly ventilated; but the defects are being remedied in compliance with the recommendations of a board.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the General Presidency Regulations. 2. The practical working of the powers of the medical officers, as regards the conduct of the line of march of troops, camping, bivouacking, billeting, &c. depends very much on the personal characters of the commanding and medical officers. 3. Camping grounds for regiments marching in course of relief are marked out by boundary pillars. They are cleared by the quartermaster's establishment, and by private servants of the officers, and men about to encamp. The tents are well ventilated and the water supply ample. On field service the selection of the camping ground rests practically with the commanding officer, who is guided chiefly by military reasons. The medical officer, if the ground were unhealthy, ought to suggest removal; but of course a large discretion must be accorded to the commanding officer.

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	4. Arrangements as regards field hospitals, transport of sick, and hospital supplies, &c. consist in the appointment of a field surgeon with an efficient staff of medical officers and subordinates, a sufficiency of hospital tents, of doolies, ambulances and boats for the transport of the sick; elephants, camels, and carts for the conveyance of tents and hospital stores, and also of a medical storekeeper, with an ample supply of medicines and instruments. The only authoritative regulations bearing on this subject, are contained in the Bengal Medical Code of 1851, Chapter XXIV. For further information I beg to refer to the report on the medical arrangement of the army of the Punjab, during the campaign of 1848–49, by superintending-surgeon, C. Renny.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1. Plan of the hospitals is transmitted. 2. The hospitals are 936 yards from the nearest barracks, more than a mile from the stables, and at a considerable distance from, and to windward of the bazaar, and houses of the residents in cantonments. The site is open, freely exposed to the prevailing winds, and is generally healthy; but there is a nullah to the westward, which is usually dry, except during the rains; this, however, is not supposed to be a source of noxious effluvia. 3. The supply of water is abundant and wholesome. 4. Refuse water, &c., is removed by means of filth carts, sent round morning and evening. There is no sewerage. 5. The floor of the hospital is of solid masonry raised two feet above the ground; but there is no perflation of air beneath. The roof water sinks into the subsoil or flows off by the natural lines of drainage, and the rain fall is carried rapidly away by means of small open ditches. The hospitals are built of kiln-burnt bricks, and have recently been roofed with thatch, which renders the buildings much cooler than tiles. There are verandahs all round the hospitals eight feet wide, which afford sufficient shelter from the sun, but are never used for the accommodation of sick, convalescents, or others. The hospitals all consist of one floor.

Table of Hospital Accommodation.

Dates of construction—various. Nos. 5 and 6 have been recently constructed.

Total number of wards, 6.

Total regulation number of beds, 176.

—	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Doors and Windows.			—
		Length.	Breadth.	Height.	Cubic Contents.				No.	Height.	Width.	
								Feet.		Ft. In.	Ft. In.	
Old European Hospital previous to 1857. No. 1 -	40	121	24	16	46,464	1,161	72·6	2	26	Doors. 6 9 Windows. 5 0	3 6 3 6	These doors and windows are of glass, with outer ones of wood.
„ 2*												
„ 3 -	40	121	24	16	46,464	1,161	72·6	2	20	All doors. 6 6	3 4	Of glass and wood alternately.
„ 4 -	40	121	24	17	49,368	1,234·2	72·6	2	26	Doors. 6 6 Windows. 4 0	3 4 3 2	The doors are of wood and the windows of glass.
„ 5 -	28	96	22	21	44,352	1,584·0	75·5	2	18	Doors. 7 0	3 6	Wooden, with fan-lights above them.
„ 6 -	28	96	22	21	44,352	1,584·0	75·5	2	18	Doors. 7 0	3 6	Do. do. do.

* This is not now used as a hospital ward; but has been partitioned off into store-rooms, &c.

Note.—Although wards Nos. 1, 3, and 4 were intended to contain 40 men each, never more than 30 patients are now placed in any of them, which allows 1,500 cubic feet to each man.

The hospitals are placed so as to receive the full benefit of the prevailing winds. There are few windows, but numerous doors on both sides of each building, opposite to each other, and are well arranged for purposes of ventilation. All doors and windows open inwards.

6. The wards are ventilated by means of the doors, windows, and ridge, and these means are sufficient to keep the hospitals at all times free of odour and closeness. There are no jalousies or jhilmils.

7, 8. The air in the hospitals during the hot and dry seasons is cooled by means of tatties similar to those used in barracks; the air never requires warming. The walls and ceilings of the wards are cleansed and limewashed twice a year, or oftener if required, for sanitary purposes.

9. The privies and urinals are situated a few yards from the end of each hospital, and have a covered corridor leading to each. The filth is received into iron pans placed underneath, which are emptied morning and evening into the conservancy carts. They are well supplied with water, and are not offensive.

10. There are lavatories off each corridor leading from the end of the hospital wards to the privies. They are sufficient for the sick.

11. One of the small end rooms of the hospital is used for bathing the sick, but a proper bath-room is required.

12. The hospital linen is always washed by native washerwomen, of whom a proper establishment is kept up.

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References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	13. The storage is sufficient and dry. 14. The cots used in hospital are wooden frames, with broad tape lacing for the bottoms, and are excellent of the kind. The bedding is inferior, the mattress being made of strong red cloth stuffed with tow. The sheets are of good cotton calico, but the blankets are coarse, country made, and lined on one side with coloured chintz. I would suggest the substitution of English blankets for country-made ones. 15. The kitchens (of which there are four) are situated at convenient distances from the hospital wards. The diets are cooked by native cooks, who are allowed an ample supply of cooking utensils made of copper, and tinned twice a month. These means are sufficient. 16. No reply to this query. 17. The following hospital establishment is sanctioned by Government for a regiment of European infantry :—

Apothecary	1 European.	Steward's servants	2 natives.
Assistant ditto	1 „	Bheesties (water-carriers)	7 „
Apprentices	2 „	Sweepers	9 „
Head compounder	1 native.	Ward coolies	21 „
Assistant ditto	1 „	Ayah or native nurse	1 „
Head dresser	1 „	Female sweeper	1 „
Assistant ditto	1 „	Cooks	5 „
Shop coolies	2 „	Washermen	5 „
Steward	1 European.	Clothier	1 „
Apprentice	1 „	Tailors	2 „
Native writer	1 native.	Barber	1 „

One hospital serjeant is allowed to every European regiment.

18. The sanitary condition of the hospitals is good, and no epidemic disease has appeared in the wards.
19. No deficiencies or sanitary defects have come under my notice.
20. The convalescents are permitted to take an airing morning and evening on elephants and in ambulances along the public roads, but there are no shaded walks or seats for their use.
21. There is a small female hospital set apart for the use of soldiers' sick wives and children, but a large one is required, with a separate ward for lying-in women.
22. There are no special local hospital regulations not included in the General Presidency Medical Regulations.
23. The recommendations of the medical officer with respect to the sanitary state of his hospital, repairs, changes of diet, &c. when approved of by the principal medical officer, are always complied with.
24. There is no hospital for convalescents in the station, nor is such accommodation thought necessary.

XIII. BURIAL OF THE DEAD.	1, 2. A new burial ground for British troops has been used since 1856, situated at the south-west corner of the cantonments, not quite out of the direction of the prevailing winds, and about three-quarters of a mile from the barracks. The very dry westerly wind which prevails must have the effect of destroying any offensive exhalation which may arise. Its area is about 22,000 square yards, length of the enclosure being 130 yards, by 58 yards broad. The soil is light and sandy, resting on and intermixed with the "kunkur." The drainage is good, having a slight slope to eastward, and decomposition takes place readily. The ground is carefully kept. 3. The space allowed for graves is 7 ft. by 2½ ft., and that between each grave is two feet. The depth of graves is six feet, and they are never re-opened, nor are more bodies than one interred in the same grave. Interment takes place at all times in from 12 to 24 hours after death. The native troops, being chiefly Hindoos, burn their dead at a distance from the station. Mahometan soldiers are buried in the Mahometan burial ground of the neighbouring city or village. 4. The graveyard is never offensive. The bodies of British soldiers at this station are usually carried to the burial-ground in doolies or litters borne by native bearers. By recent General Orders of the commander-in-chief, a hearse for the above purpose is directed to be supplied to every military station, which will be preferable to the present mode of burial. 5. The dead of camp followers and bazaar people are disposed of in the same manner as the native troops. 6, 7. No injury accrues to the public health from the present practices, nor are any improvements to be suggested.

(Signed) GEO. CAMPBELL, Major-General Commanding at Benares.
A. G. PRIESTLEY, Captain Executive Engineers.
ALEXANDER GIBBON, Deputy Inspector-General of Hospitals, Benares Circle.

Benares, 1st May 1861.

AGRA.

Accommodation

Queen's Troops	Artillery	- -	8th Battery, 11 Brigade Royal.
	Cavalry	- -	200 Camel Corps, Europeans.
	Infantry	- -	3rd Battalion Rifle Brigade, 1,086.
Native Troops	Cavalry	- -	200 Camel Corps, Sikhs.
	Infantry	- -	Agra Levy, 530.

References to Subjects and Queries.	Replies.
I. TOPOGRAPHY.	1. The surrounding country is a level plain, intersected by the river Jumna, which passes a mile and a half to the east. It is flat, dry, and sandy, and there are few trees and no jungle. 2. The station is situated on a level with the surrounding country, at an elevation of 800 feet above the level of the sea, and 50 feet above the river Jumna. There is no higher or healthier ground adjoining the station.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	3. The nearest mountain land is a rocky ridge at Futterpore Seckra, about 100 feet high; there is no high table-land near. 4. The nearest water is the river Jumna, which passes within 1½ miles to the east of the station. The Kara Nudder is 12 miles to the south, and there is some marshy ground near Futterpore Seckra, about 18 miles to the west. The vicinity of the station is not liable to overflow. There are ravines along the bank of the Jumna, extending to the officers' bungalows; their vicinity is considered objectionable from being hot and unhealthy. 5. The station is open, with few trees in the gardens, the walls of which are low and offer no obstruction to the free circulation of air, nor do they prevent external ventilation. The temperature of the station is hot, from the baked dry soil, in the hot season, and the ravines contribute to the heat. The station is not exposed to cold or variable winds. 6. The surrounding country is cultivated, except in the vicinity of the ravines. There are no works of irrigation near the station; a canal was commenced near Futterpore Seckra, but it has not been used; the irrigation from the wells is not injurious. No rice is cultivated in this part of the country, and but little indigo in the vicinity, and none within five miles of Agra. There is very little hemp or flax cultivated, and they produce no injury to the health of the station. 7. The city of Agra, with its suburbs, is about a mile to the north of the station; it contains a population of 152,000 inhabitants. 8. The surface and soil of the district is composed of alluvial deposit of alternate strata of clay, sand, and lime. There were formerly suburban houses, gardens, and cultivation on the site of the present station. 9. Water is found at a depth of 65 feet below the surface during the dry season, and at about 55 feet during the rainy season. 10. The rain that falls on the parade and in the vicinity of the barracks chiefly sinks into the soil; in consequence of the ground being level a small quantity runs into the Mota Konah tank, which drains into the ravines towards the river. There is no marshy ground from water lodging on the surface, nor does the water ooze out on the surface. No drainage from higher ground passes into the subsoil of the station. 11. The water supply of the station is derived principally from wells; occasionally the river water is brought for drinking and gardening. The Mota Konah tank, which is 80 yards square, is in the middle of the station; there are two small tanks, 30 yards and 20 yards square, to the north and west of the station; also a small tank, 30 yards square, to the south of the parade. The Mota Konah generally contains water during the whole year,—the others are dry in the hot season. There are no fish or rank vegetation in the tanks; the Mota Konah is reserved for culinary and drinking purposes, the remainder are for bathing. The wells are not liable to pollution from leaves; the tanks receive the drainage from the vicinity, but they are not used generally for drinking purposes. No nuisance or malaria proceeds from any tank within or without the station. 12. The amount of the available water supply is limited by the number of the wells. The well water is very salt, with a few exceptions. Water is occasionally brought from the river. It is considered heating during the rainy season. The water contains large quantities of the muriate and sulphate of soda and lime. Few wells are used for drinking purposes, as the ordinary well water is laxative and apt to disagree at first. The supply is sufficient. It is raised in leather bags by bullocks, and carried in skins, called nussocks, by bheesties, for the use of Christian and Mussulman; the drinking water for the Hindoos is carried in brass or earthen jars. 13. There is a fall of about 32 feet from the station to the river, which carries off the rainfall rapidly, and the subsoil is sandy, filled with bricks, which renders evaporation quick. These, together with the absence of marshy ground and rank unhealthy vegetation, have given to Agra the reputation of being, after the hills, the healthiest station in India; but of late years it has lost its character from attacks of epidemic cholera. 14. With regard to the amount and kind of inquiry instituted before the selection of new stations, there is no established practice. The senior medical authorities ought to be consulted in the selection of cantonments or barracks, but it would be better to have a special officer selected for this duty. No ground ought to be selected till the history of the place is known,—whether it has been previously inhabited; where the people of the country consider the "howah pane,"—air and water—bad, should be avoided; and the state of the locality *during the rainy season*, and that of the surrounding country, ought to be ascertained. The barracks should be constructed according to the state of the ground; the damper and hotter that is, the higher the beds should be placed.
II. Climate.	1, 2. A thermometer is supplied to each regimental surgeon, by whom, in peaceful times, a daily register of the temperature of the hospital is kept. There is no meteorological register kept in this office. The registers are transmitted to the office of the Director-General in Calcutta. 3. The climate from the end of October to the beginning of April is cool, clear, and healthy; it is very hot and dry, and not unhealthy, till the end of June, when exposure to the sun must be avoided; till the end of September it is hot and moist, during which time fevers are prevalent, though not generally dangerous. The country is destitute of trees, and there is no canal irrigation influencing the climate. The atmosphere is impregnated with dust during the hot season, the heat of which is very exhausting to the constitution. Much animal food is not required; exposure to the sun is to be avoided, and the temples protected from its influence. Flannel bands should be provided to protect the stomach and loins from sudden changes of temperature; and violent exertion is to be avoided in the rainy season. The floors of the sleeping-rooms should be at least 10 or 12 feet above the level of the ground. The best times for drill is the morning and evening. November to April are the most healthy months; August, September, and October are the most unhealthy, during which months fevers of a miasmatic type prevail, complicated with dysentery. *Coup de soleil* is frequent in May and June, and liver complaints are prevalent in the hot and rainy seasons.

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	4. There is no district near the station the climate of which is more conducive to health. 5. The stations at which I have served are Agra, Muttra, Meerut, Kurnaul, Umballa, Loodiana, Ferozepore. The climate in all these is the same, the cold season lasting the longer the further north the station. With the exception of Kurnaul, I consider these to be healthy stations. Kurnaul became sickly after 1837 in consequence of the extension of the canal irrigation. Towards the end of the rainy season it is most unhealthy, and miasmatic feyers with dysentery prevail. During the hot season sun-stroke is frequent in the southern stations. Mhow, Nunald, and Indur have similar climates, but the cold season is shorter, the hot winds less intense, and the rains cooler than in the before-mentioned stations. Miasmatic diseases are prevalent and dangerous during the rainy season. The sanitary depôt at Landour enjoys a cold invigorating climate, very conducive to recovery from tropical diseases, except during the rainy season, from June to September, when the damp is excessive. Mineral springs abound in the vicinity; sulphureted and chalybeate waters were used with great advantage, and it was proposed to build a detachment hospital for the use of the convalescents; this was interrupted by war, but it is very desirable that it should be carried into effect as soon as possible.
III. SANITARY CONDITION OF STATION.	4. Table of barrack accommodation:— The date of the construction is unknown, the records being destroyed. Total number of rooms or huts—76 quarters for serjeants and 23 wards for men. Total regulation number of non-commissioned officers and men, 1,776.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents, in Feet.				Number.	Height.	Width.
		Ft.	Ft.	Ft.				Ft. In.		Ft.	Ft.
2 Artillery Barracks -	64	213	24	20	102,240	1,597	79	1 6	22	7½	4½
6 New Infantry Barracks -	Main Wing. 96	288	24	28	183,536	1,912	72	—	48	14	4½ Circular openings.
	Side Wing. 48	288	12	20	69,120	1,440	72	—	24	11	5 Doors with over lights.
5 Old Infantry Barracks, 1 size - -	96	242	24	26	150,956	1,573	60·5	—	48 48	7½ 2	4 Door. 4 Window.
2 Old Infantry Barracks, 2 size - -	80	209	24	22	110,352	1,379	62·7	—	34 34	7½ 2	4 Door. 4 Window.
2 Fort Barracks	68	204	24	20	97,920	1,440	72	—	34	8	6 Door.
Guard-room -	16	50	20	24	24,000	1,500	62·5	1 6	8	7·5	4·5 Door.
Prison Cells, 20	1	8	8	16	1,024	1,024	64	—	1 Door. 1 Wind.	7 3	2·5 2

5. There are no windows, but a door on each side of the room, with glazed fanlights over them. There is a verandah all round the barracks, 12 feet wide, not now occupied as sleeping quarters, but they have occasionally been so occupied when there was a want of barrack-room. No jalousies or jhilmils are allowed to the barracks.
6. The bedsteads used in barracks are of wood, 6½ feet by 3 feet, raised 1½ feet from the ground; the bottoms are made of cotton-tape, called newar, or of grass rope, called mangh. The bedsteads should be iron, as being more easily kept free from bugs.
7. The tents are made of cotton, with a double fly.
8. The barracks are furnished with iron ridge ventilators, with ventilating holes in the inner walls. The ventilation is sufficient to keep the air pure night and day, provided the verandahs are not occupied as sleeping rooms. The barracks are cooled by tatties and punkahs (tatties are screens made of the roots of an aromatic grass, on which water is constantly sprinkled). The hot west wind, of the temperature of 120° Fahr., passes through reduced to 80°. The punkah is a rectangular framework, 6 feet by 2 feet, covered with cloth, and having a cloth fringe. It is suspended to the tie-rods, or beams, made for the purpose, by cords of thin wire, pulled by coolies. They cost about 10 rupees each.
9, 10, 11. The barracks are constructed of burnt bricks and mortar, with thatched roofs. There are no huts, the tents are of cotton cloth. The floors are made of stone flags over brick on edge laid in lime cement. They are raised 3 feet, and filled in underneath with rammed earth; there is no passage of air beneath. The materials are good and the construction solid, and the ventilation and space is sufficient. The barracks are objectionable from not being raised sufficiently above the malaria which exists in all tropical climates during the rainy season. They should be two storied buildings, the upper story being at least 12 feet from the ground; and if the lower story were raised 3 feet, and made 14 or 16 feet high, it could be occupied as orderly, school, reading, store rooms, guard-room, and workshops. It might also be occupied by the married families, or even part of the corps, who would be in a sanitary view as well as now, whilst the main body would be in a healthier atmosphere. The expense would

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	not be greater than the present style of barrack with the outhouses. The barracks are kept in repair by the executive engineer and barrack-master, and the repairs are quickly executed. The sanitary officer and medical officer in charge of the corps is responsible for the general sanitary state of the cantonment. The walls of barracks are cleansed and whitewashed annually by the executive engineer, and when required by the sanitary officer in excess by the barrack-master. 12. The lavatories are built of solid masonry, with a tiled roof. The hand basins are supplied with water from a copper cistern filled from a tank attached to the well, about 20 yards off, by an underground pipe. The waste water is collected in cesspools and carted away. There are four baths for the men, which are supplied by wells attached to the bath-houses, and the water is carried away by surface drainage. The urinals are in rear of the wash-house, and all water passes through the urine trough. 13. The cook-houses are built of solid masonry, with a tiled roof, with a verandah to the front, and to the back. Chulahs or native fireplaces are built, there being a row of ventilators above to pass the smoke off. Water is supplied by water-carriers, and the refuse water is drained into covered cesspits and carted away. The linen is washed and dried by dhobies, or washermen. It is washed in the river Jumna, dried on ropes, and ironed at home. The supply of dhobies is ample. 14. The privies are built like the wash-houses of solid masonry, with metal buckets beneath each seat, removable from behind; the seats are divided off by stone slabs. The soil is removed by carts. 15. The cook-house, privies, &c. have ridge ventilators, all the buildings being tiled. The barracks are lighted at night by oil lamps suspended from the centre of the building. 16. There is no flow in the drains, except during the rainy season. The barracks are drained by surface drains of various sizes, up to 3 feet deep by 8 wide; the outlet drain runs between the artillery and infantry lines. The surface water lodges within the vicinity of the barracks, in consequence of the dead level of the ground, until it sinks into the sandy soil, rendering raised paths necessary between the barracks. This ought to be remedied by a general system of drainage. The water from the lavatories is collected in an open cesspool, from which it is spread over the ground; deep wells ought to be sunk for the reception of this water. There is no unusual dampness in any part of the buildings used as barracks or hospital. The fluid refuse sinks into the subsoil; part is carried away in carts from the cesspits, and a portion evaporates. The cesspits attached to the wash-house are 6 × 8 × 3 feet deep, and about 100 feet from the well. They have been condemned, and deep wells recommended in their place. Their distance from the barracks is 80 feet. The refuse water is removed in barrels every morning. The cesspits in the hospital are deep wells, and never cleaned; but they are tried to be kept sweet by lime, but in vain. New privies on a similar plan to those in the barracks are in progress of construction. There are no foul ditches. 17. The barracks are cleaned, &c., the roads swept, and the refuse near the cook-rooms carted off outside the cantonments daily. 18. The surface of the cantonment is bare and brown, except during the rainy season, when grass springs up, and is grazed down very closely. There are a few gardens round the bungalows of the officers, but the water is salt, and not suited for floriculture; though vegetables grow well, particularly the Cruciferi. There are no old walls, thick hedges, &c. interfering with the ventilation of the station. 19. The bazaar is open, clean, and well ventilated, and not crowded. The supply of water from wells is abundant, but rather saline. The bazaar is swept daily, and all filth is removed. No improvement is necessary in the sanitary police arrangements. The native houses are clean for native villages, but are all too low. The streets are narrow and irregular, with dunghills at the skirts of the village. The more respectable houses have cesspools, which are emptied by the public sweepers. The surrounding fields are visited morning and evening for natural purposes by the inhabitants generally. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. The slaughter-house is at the western extremity of the station; the offal is removed to a distance, and is devoured by dogs and scavenger birds. There is no inconvenience experienced at the station from the slaughtering places. 21. There are no arrangements for stabling and picketing bazaar horses. There are very few of them, and they are kept within the enclosed areas of the houses. The manure is formed into fire-cakes, called "kund," and the bedding is eaten by buffaloes. 22. The artillery stables are open sheds running east and west; they are formed into two rows, and closed with mat or grass screens to shelter the horses from cold and rain; they are between the artillery and infantry barracks. Light and ventilation come from the sides; the manure is removed in filth carts. The stables are 150 yards from the barracks of the artillery to the south, and 350 yards east of the infantry hospital. 23. The married families occupy a large separate barrack with plenty of room; none of them occupy the barrack-rooms with the men.
Officers' Quarters.	1. The officers live in separate bungalows, well ventilated, and with large open compounds; they are well drained and kept clean. All tropical buildings should be two storied; at least there should be a room upstairs to sleep in during the rainy season, and the lower floor should be four feet above the surface of the ground.
IV. Health of the Troops.	1. The station, district, and the adjoining native population are healthy. 2. The diseases most prevalent among the native population are sun-stroke in the hot season, fever and dysentery in the rainy season, with a few cases of spleen disease in the low ground in the vicinity of Futterpore Seckra. Small-pox prevails every cold season. There have been three severe attacks of epidemic cholera, viz., in 1843, 1856, and 1857; in 1851 it was severe in the district, though the European troops were little affected. 3. The healthiness of the native population depends on the dryness of the climate and the absence of marshy ground. 4. The troops now at Agra have come from the campaign against the mutineers; they have been at no station. There has been more sickness in the infantry than in the artillery lines, owing to the surface water lodging to a greater extent near the infantry barracks.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	5. Troops are occasionally moved into camp in October or November for change of air, with marked benefit, when there is excess of sickness lingering in the lines after the rains. The artillery go into camp in an open plain three miles west of the station during the cold season for annual practice. 6. I was in charge of the sanitary depôt at Landour from September 1842 to October 1844. The climate is highly invigorating and bracing, except during the rainy season, when it is damp and raw; it is highly beneficial in debility arising from fever, ague, and spleen, bowel and liver complaints, especially in young men. In extensive, as in chronic diseases, a residence during the cold season is necessary. Diseases of the head, heart, or kidneys should not be sent to the hills. In affections of the lungs and scrofula, the benefit of residence in hill stations is doubtful, and questionable in rheumatism and venereal cases. Much benefit would arise in these cases if the detachment hospital which was approved of was constructed at the sulphur springs, where bathing in the waters proved very beneficial in otherwise untractable cases. 7. The regiments that came from the hill stations to the siege of Delhi were more healthy during the campaign than the troops which came from plain stations and the Punjab; the men had more stamina to start with. Children on coming down from the hills in November generally have attacks of feverish cold, owing to the great variation in the temperature of night and day. Attention to clothing and avoiding exposure to the sun in the middle of the day, on returning to the plains, will avert the danger. 8. I decidedly approve of selecting hill stations for troops. 9. There are no particular diseases to which troops are liable to be attacked on going to hill stations. In some stations there is a tendency to looseness, and colds are prevalent in April. 10. Sick men approaching convalescence get a strong appetite on going to hill stations, and are apt to eat more than they can digest. They should be much in the open air, with the head protected from the sun by a broad-brimmed hat; they should always wear a flannel belt, avoid violent exercise immediately after eating and exposure to the sun. 11. The hot season is most agreeable, but the cold season is most invigorating; the rainy season is most disagreeable and sickly, but more healthy at this season than in the plains. From April to November inclusive is the shortest period necessary in hill stations for recovery from debility following an acute attack where there is no extensive organic disease in a young man. Chronic cases, and those where there is extensive organic disease, require a residence during the cold season, and occasionally during two cold seasons. The convalescents should not return to the plains until the middle of November. Regiments stationed in the hills might return to the plains at the end of October. 12. There is no period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service in the plains. 13. The special precautions necessary on leaving hill stations for the plains is to avoid exposure to the sun and excess in eating or drinking. 14. The men keep up their stamina best in the hills, and even if ordered down to the plains on service in the hot season, they stand work better than troops that had not left the plains. This was proved in 1857, when troops were brought down from the hill stations of Kussowlie, Soobathoo, and Dugshai to Delhi in May, and served with the troops from Meerut and the Punjab; the hill troops had less sickness and were best able for work. Frequent change of station in the plains is beneficial. 15. The barracks are imperfect at Landour. A small hospital is much required near the sulphureted mineral springs in its vicinity for debilitated cases, affections of the chest, rheumatic and venereal cases, particularly during the cold season. This was approved of by the medical board, but the construction postponed in consequence of war expenses; it should be carried into effect. 16. The Himalayan hill stations vary in elevation from 4,000 ft. at Soobathoo to 8,000 ft. at Landour. The lowest is beyond the influence of tropical climates, and is less cloudy than the higher elevations, but not so cold and bracing. There is no objection to any intermediate elevation for sites for hill stations. Plenty of level ground, with a good supply of water, and easy access to the plains, including the extent of the Terrai at the foot of the hills, should regulate the locality. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. The black soil of Central India is unhealthy for stations after the rains; it induces ague and dysentery. 19. Soldiers should be sent to India as soon as they have attained their full growth, and should land there in November. Troops on landing in Calcutta are sent into barracks at Fort William, Chinsurah, and Dumdum, where there are good barracks. Duties and drill depend on the officers commanding. Clothing according to the seasons is supplied at once. To preserve the health of recruits, they should avoid exposure to the sun, eat moderately, and drink temperately; never taste spirits till after sunset, and only eat animal food once a day. Coffee in the morning is better than spirits on a line of march or in cantonments. 20. Troops should be drilled at home, and then sent out to India direct. The danger of the earlier years of service arises from imprudent living, exposure, and want of experience in diminishing the inconveniences of the climate when marching or in cantonments. These form innumerable petty details, which can only be learnt by practice. 21. Troops are transported from the port to the interior in carts drawn by bullocks, which travel about 40 miles a day. Staging barracks are being erected along the line of road. 22. The number of years a British soldier should serve in India is 10. 23. With regard to the mode of conducting the business of medical boards in reference to invaliding, commanding officers sometimes bring forward men for being stupid and inefficient, without bodily ailment to cause unfitness. Men of this description should be brought before a special committee of military officers. 24. Invalids should leave India for home in January, or so as to arrive in England in May or June.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*—*Diseases.*	1. There are regular inspection parades every Saturday morning for the discovery of incipient diseases at this station. 2. Scorbutus has not prevailed among the troops at Agra. There were formerly a few cases among the native prisoners in the gaol; but not of late years, since vegetables have formed a part of their regular food. The disease was in their cases attributed to want of variety in the food and a deficiency of fresh vegetables. There was only one case of scorbutus out of 4,605 admissions last year. 3. The proportion of cases of *hepatic* disease was 4·89 per cent. during the year. The disease arose from over-action in the liver, caused by heat, exposure to the sun, and abuse of alcoholic liquors. It is a frequent sequela of miasmatic fever, but often an original disease, accompanied by fever. It would be diminished by avoiding alcoholic liquors, exposure to the sun, and excess in diet. A flannel belt should be always worn. 4. Dracunculus does not originate in Agra; it is a local disease, entering the system when bathing in tanks and other localities. 5. The proportion of constantly sick from venereal disease is 15·45 per cent. during the year on the strength, or 8·77 per cent. on the admissions from other diseases. To diminish the disease, the prostitutes should be under the orders of the cantonment magistrates and the quartermaster of the regiment; and they should be examined weekly by a medical officer. A Lock hospital should also be established. 6. The troops at the station suffer from diseases of the epidemic and endemic class. Continued fevers and sun-stroke are prevalent during the hot season. Miasmatic fevers prevail during and after the rainy season, when dysentery is also most prevalent. There were severe attacks of cholera in 1843, 1856, and 1857, and there were slight attacks in 1845 and 1851. There have been 239 deaths from cholera during the last 20 years, which is equal to an annual mortality of 1·13 per cent. on the strength. In 1847 and 1858 there were 22 cases of small-pox each year, and in other years an occasional case at the end of the cold season. There are a few cases of rheumatism at all seasons. TABLE of Sickness and Mortality among the European Troops at Agra, from the Year 1839 to 1858, from the Records in the Office of the Superintending Surgeon.

Station Agra.				Fevers.				Small-pox.		Diseases of Liver.		Diseases of Bowels.		Cholera.		Rheumatism.		Venereal.		Other Diseases.	
				Continued.		Miasmatic.															
	Strength.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Average during 20 years	1047·92	1845·40	50·50	265·60	4·70	418·80	4·45	3·40	0·65	51·30	2·95	247·35	9·10	31·25	11·85	80·35	0·15	161·95	0·05	580·40	16·50
Ratio per cent. to strength	—	176·10	4·82	25·34	0·44	39·95	0·42	0·32	0·06	4·89	0·28	23·60	0·86	2·89	1·13	7·66	0·01	15·45	0·004	55·39	1·57
To Total Admissions & Deaths	—	—	—	14·33	9·30	22·69	8·71	0·18	1·28	2·78	5·84	13·40	18·09	1·69	23·46	4·35	0·29	8·77	0·09	31·46	0·89
Deaths to Admissions from each Disease	—	—	2·73	—	1·77	—	1·0		19·11	—	5·75	—	3·68	—	37·92	—	0·18	—	0·05	—	2·84

7. The more frequent diseases are, in the rainy season, miasmatic fevers and bowel complaints; in the hot season, continued fever and affections of the head and liver; in the cold season, affections of the lungs and diseases arising from imprudence. The seasons when such diseases are most prevalent are May and June, when the air is intensely hot and dry; they are also prevalent in the rainy season, in August and September, with its warm moisture. These diseases are the effect of the general climate, and are not aggravated by imperfect conservancy nor localized in the station. Drinking spirits and going in the sun lead to sun-stroke in the hot season; and sleeping close to the ground in the rainy season predisposes to miasmatic fever.
8. There were severe attacks of epidemic cholera in 1851, 1856, and 1857, but they were not connected with the soldiers' duties or influenced by the barracks. The endemic diseases are the ordinary tropical diseases, appearing at certain seasons, but less here than in general in India. There was considerable sickness after the exposure during the hot season on service in 1858.
9. Quinine is frequently exhibited in small doses during the rainy season, and apparently with the effect of keeping off malaria. It should be alternated with cheryetta or some other tonic, as continued use blunts the action of any medicine.
10. The prevention of the diseases which prevail during the rainy season in all tropical climates can only be accomplished by removing the men above the influence of the cause, *i.e.*, miasma. This, experience proves, does not extend above 12 feet from the surface of the ground. This could be accomplished by having two-storied barracks and hospitals,—the lower story could be economized by being occupied as store-rooms, orderly-rooms, school-rooms, guard-rooms, serjeants' mess-rooms, married quarters, and workshops. If the floor of the lower story were raised three feet, and the rooms made 14 or 16 feet high, it would be as healthy and cooler than the present style of barrack, while the upper story would be unquestionably much healthier, and the expense would not be greater than that of the present barracks, including all the outbuildings.

V. INTEMPERANCE.

1. The soldiers at the station are usually temperate; there are no confirmed drunkards.
2. There were four admissions last year into hospital from diseases directly caused by intemperance, but the number admitted indirectly from the same cause is uncertain, as the connexion is not always evident. There are no total abstinence men, and no data available to form a statistical table showing the effect of total abstinence, tempe-

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	rance, and drunkenness on the amount of sickness, mortality, and crime. The troops now at the station are sober, and there is but little crime. Drunkenness is always punished as an offence when discovered. 3. Distilled spirits are sold at the canteen, but forbidden in the bazaar. During the cold season one quart of beer and two drams of rum are issued to each man per diem, and in the hot season, from April to September, one quart of beer and one dram of rum. The average consumption during the year per man per diem is one quart of beer and one dram of rum. Spirit is no part of the ration at any time. It is supplied to the canteen by the commissariat, and retailed under regimental regulation. No spirit is issued till 6 p.m. One pint of beer is issued at noon for dinner; another pint and a dram are issued after sunset; no liquor can be obtained at any other time. The evil effects of spirit drinking were manifest during the last service in the field. The canteen is shut to convalescents, unless the medical officer should recommend them to have beer. No drinks other than intoxicating drinks are sold at the canteen. Every kind of spirit or intoxicating agent is prohibited in the bazaar. 4. The consumption of spirits in excess is injurious, and they are also injurious during exposure to the sun. In moderate quantities, especially in the shape of beer or porter, it is useful in promoting digestion. Spirit is the bane of the European soldier when taken in excess, and a frequent cause of crime and breach of discipline, but the hardest drinkers are not always the least courageous or intelligent soldiers. Being issued from the canteen, it is better than to procure it from the bazaar. 5. It would be better if the troops drank only beer or porter, but they will have spirits, and it is better they should have good spirit from the canteen, than bad from the bazaar or surrounding villages. When the men have money and inclination, they get spirits; but it might be prohibited to boys or lads under 18. 6. Malt liquor and wines promote digestion, and are less liable to be taken to an injurious extent. The stimulant action of the alcohol is combined with a bitter and aromatic principle, which acts as a tonic and modifies the reaction from spirits, thus preventing the reaction which inclines to stimulants. 7. Coffee and ginger beer are largely consumed at the station. Coffee in the early morning and on the line of march is of the greatest advantage. Tea is agreeable in the hot season and rains. Spirits are always injurious in the morning, and it is better not to taste them, or wine or beer, till the sun has set. 8. It would be beneficial to the health to abolish the spirit ration, and to substitute for it beer, tea, &c.; but I doubt its being practicable, particularly with old soldiers. If all kinds of alcoholic drinks were stopped, there would be danger of opium eating taking their place. In marching, during a campaign, they cannot be dispensed with. 9. The abolition of the sale of spirits would drive the men to the bazaar to get a worse and cheaper liquor. 10. The recommendations I have to make on these points are to encourage the men to drink beer, by having it good and cheap, and not to sanction the use of spirits till after sunset. 11. The following are the more important of the canteen regulations:— "The canteen is opened at 12 o'clock for the issue of one pint of beer per man, which is taken to the barrack-room for dinner. "It is opened again at 5 o'clock for the issue of one pint of beer and one dram; one hour to elapse between these two. "A corporal from each company attends while the canteen is open to mark up issues. "The canteen is closed at gun-fire. "Defaulters are not permitted to enter the canteen. "A coffee shop is established near the reading-room." All the orders are strictly obeyed.
VI DIET.	1. The daily ration issued to British troops consists of,—bread, 1 lb.; meat, 1 lb.; rice, 4 oz.; sugar, 2½ oz.; tea, ⅝ oz., or coffee, 1⅝ oz.; salt, 1 oz.; vegetables, 1 lb.; and firewood, 3 lbs. The vegetables vary according to the season—potatoes in spring; cauliflower and cabbage in the cold season; and pumpkins in the hot and rainy season. Beef is issued five days and mutton two days in the week. The ration is inspected every morning by the quartermaster, and occasionally by the commanding officer and surgeon. A regimental committee is held on provisions considered unsuitable, whose decision is final. 2. The ration is complete, and the supply of vegetables is sufficient. There is no stoppage. The number of meals per diem is three—breakfast at 8 a.m., consisting of tea, bread, eggs, and fish; dinner at 1 p.m., of soup, meat, vegetables, &c.; tea at 5 p.m., consisting of tea and bread. Milk, butter, fish, eggs, &c. are provided in addition to fruit when in season. The troops have at least 1 lb. of vegetables, either potatoes, onions, turnips, carrots, cabbage or cauliflower, and pumpkins. About 20 oz. of green vegetables are allowed in the ration. 3. The grass-fed mutton, which is served out twice a week, is very inferior; it would be beneficial if a superior quality were allowed. The practice of allowing the men to purchase and use extra articles is general, and works well. The rations are cooked by responsible individuals; the men do not see them till on the table; they are served out to mess orderlies. No attempt to dispose of the rations by the cooks or men has ever been suspected. 4. The cooking utensils in use per company are—2 copper boilers of 8 gallons each, 2 ditto of 7 gallons; 2 ditto of 2 gallons; 4 gridirons, 4 frying pans, 8 ladles, 4 choppers, and 4 buckets. The copper vessels are tinned and repaired by the commissariat department when required. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. The food is varied in its preparation according to the taste and pleasure of the mess. The cooking is good, and the facility with which cooking-places are constructed on a line of march, and a varied dinner produced under difficulties, is worthy of notice. The men have tea or coffee sometimes before a march, and sometimes during a halt half way. Coffee is generally used. 5. The wells being deep, and the water salt, and the hot dry wind being very intense, gardening can *only be* conducted under difficulties, which are rarely encountered by

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	officers who can afford to pay well for the amusement. The proceeds of a garden would not pay the expenses of an establishment, without which soldiers' gardens could not be kept up. They would be advantageous if the men could be induced to work in them; but this very few of them will do, except for a novelty the first week or so.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of a wicker helmet with kakee puggree, or kakee American drill trousers, and short frock in the hot season, short boots, black leather pouch and sword belt, flannel waistcoat, shirt, cholera belt, and socks. For winter—full dress green cloth tunic and cloth trousers, undress serge frock and tartan trousers. A tight-fitting cloth coat is not suited for service in India, a loose cotton dress answers better, with a cotton padded overcoat for cold weather and night work. The Kilmarnock cap is not suited to this climate. The broad leather belt across the breast for supporting the pouch is oppressive during a march, two narrower belts crossing at the back and coming over the shoulder, and straight to the waist belt, would be an improvement. The dress should be made to fit loosely, particularly about the neck. The guard dress is the same as that for parade. Sentries are protected from sun and rain.
Duties.	1. Whatever perfection a recruit might attain in drill at home, he would have to go through it again at the head-quarters of his regiment; this is necessary, but as a recruit is non-effective till drilled, this period should be spent in the healthiest climate, more particularly in the case of growing young lads, who fill out best in a cold climate. 2. During the hot season the following are the soldier's duties:—He rises at gun-fire, half an hour after which is parade; guard mounting takes place at the same time. Short drill every morning, and three times a week without arms; setting up drill for half an hour. Breakfast at 8, and dinner at 1 p.m. Evening parade is at 6 p.m.; there is no drill then except for defaulters, 1 hour. During the cold season parade takes place at 6.30 or 7 a.m., drill till 8 every day; breakfast at 8.30; dinner at 1 p.m.; evening parade, 5 p.m. Instruction drill three times a week till 6 p.m., and three times a week general drill. The drills are beneficial to health, as exposure to the sun is avoided. The above-mentioned hours are satisfactory. The hours for marching should be so arranged as to enable the men to reach the camp at 8 o'clock in the cold season, and at sunrise in the hot season. The men have between four and five nights in bed on an average. 3. The regimental guards mount on the parade ground, and are relieved every 24 hours. The garrison guards mount on the grand parade, one mile distant from the barracks, once a week. Rolls are called by day at rouse, breakfast, dinner, evening meal, and at morning and evening parade, and at tattoo, and only at night when necessary. There are no particular evil results from night guards. As a precaution, it is necessary to insist on the wearing of a woollen belt in cold and damp weather.
VIII. Instruction and Recreation.	1. The means of instruction and recreation are as follows:—There is a good double ball court, and a good double skittle alley for the infantry; single alley for the artillery. There is a good regimental schoolmaster and five assistants in the infantry, but no assistant in the artillery; and there is a good Government library and reading-room, indifferently lighted at night. A soldier's garden exists in the vicinity of the artillery barracks, in which the men walk; it is worked by natives, and supplies the messes with vegetables. There are no soldier's clubs or day-rooms nor any workshops. No building is available in the barracks for the purposes of a theatre, but the company have use of a public building in the cantonment. There is no gymnasium, as the spot should be protected from the sun. The above means are insufficient to keep the men occupied during the wet season and the heat of the day. The men are strictly forbidden to leave the barracks in the hot season between morning and evening parades. This rule is essentially necessary when the hot winds are blowing; the restriction is very irksome, and the period of restraint is gradually diminished as the mornings and evenings get cooler, but the avoiding of exposure to the sun is essential to health. 2. A large covered building near the barracks, as a gymnasium, would be available for many games, and would draw many men from their cots where they idle and sleep all day. A large swimming bath is very useful. Workshops might be introduced with great advantage, where the men might profitably occupy their spare time both mentally and bodily. 3. Soldiers' savings' banks already exist, and are advantageous for provident men; but there is no harm in the men spending their pay in innocent enjoyment. 4. There is not sufficient shade from trees, sheds, verandahs, or other means for the men to take exercise during the hot weather without injury to health. Trees in the vicinity of the barracks would be objectionable.
IX. Military Prisons.	1. The cells are a range of tiled rooms, with a verandah on each side, surrounded by a high wall. They are freely ventilated, and no sickness has been induced by residence in them attributable to the locality.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2. The medical officers are not consulted regarding the sites of camps, which are selected by the quartermaster in advance. Further than general advice as to the hour of marching, and the avoidance of low damp camping grounds, their advice is not looked for. 3. The camp is pitched in clear high ground near a supply of good water. In the hot season under trees the shade is agreeable, but in the rainy season it is dangerous; the water is supplied in leather skins by water-carriers. Nuisances are prevented close to camp, but in a few days the vicinity becomes disagreeable. When a camp is expected to be stationary for days, trenches are dug, which are covered in every day. The medical officer has to attend to the sanitary state of the lines of his corps. 4. During service in the field 10 per cent., and during peace 5 per cent., of dhoolies are supplied for the conveyance of the sick. There is no more comfortable conveyance for a sick or wounded man than this; the motion is moderate, the rate of progress is about

References to Subjects and Queries.	REPLIES.
X. Field Service—*cont.*	3½ miles per hour, and the dhoolie forms the bed of the wounded man, without the necessity of moving. The great objection to the dhoolie lies in the number of men required to carry it, viz. 6. A two-wheeled spring cart, drawn by bullocks, is well adapted to this country. The medicines and stores are carried by camels in large camel trunks. Food and necessaries are supplied by the commissariat department. The regulations in reference to field hospital service are contained in the new Medical Code, published in 1851.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.
XII. HOSPITALS.	1, 2. The infantry hospital is 400 yards north of the barracks. The artillery hospital 14 yards west of them, 835 yards distant from the stables, and 150 yards east of the bazaar. The city of Agra is about 2 miles to the N.N.W. The site is open, with neither houses nor trees to interfere with ventilation. It is healthy, but the drainage is rather defective. There is no malaria from the river, which is two miles off, and there are no nullahs, ditches, or other nuisances near that are the cause of sickness.
	3. The supply of water is ample from wells, though it is generally very salt. There are several sweet wells that are generally used for drinking purposes; they are near tanks. The river water, when filtered, is good, except during the rainy season, when it is said by the natives to be heating.
	4. There is no surface drainage during the hot and cold season, the washing and bathing water spreads over the ground and sinks into the soil or evaporates. The stool pans are emptied into the well privies; this is being altered, and a privy and wash-house like those used in the barracks are being built. The main drain which runs after heavy rains, during the rainy season, passed in front of the hospital gates, but it is not offensive.
	5. The hospital has only a single floor, which is raised 2½ feet, and is filled in with earth. The roof water sinks into the subsoil when not very heavy. After a heavy fall it runs off by the compound drains to join the main drain in front of the hospital gate. There is a saucer drain between the two blocks of buildings, which drains the whole compound, the earth being sloped down from the hospital to the drain. The surface water does not lodge in the compound. The walls of the hospital are built of brick and mortar, 2 feet thick, with a thatched roof, 9 inches thick; neither are double. There is free ventilation, and the roof and walls are sufficiently thick to keep the building as cool as practicable. The inner ward is surrounded by double verandahs, 12 feet and 10 feet wide, and they afford sufficient shelter from the sun's rays. The inner verandah is frequently occupied by the sick and convalescents. The hospital consists of a ground floor only.

Table of hospital accommodation:—

The date of construction is unknown, the records having been destroyed.

Total number of wards - - - 3
Total regulation number of beds - - 120

Wards or Hospital Huts, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patients' Beds above Floor.	Doors.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.				Feet.			
European Infantry 2	40	123	24	29	85,408	2,135	73·7	1·5	20	8·25	4
Artillery 1 - -	40	110	20	24	52,800	1,320	55	1·5	20	9·	4

The hospital receives the full benefit of the prevailing winds. There are no windows, only doors, which, when open, allow of free ventilation.

6. Ventilation is effected by open ridge ventilators all along the roof. The doors are all opened in the morning, and kept open during the day in the cold season; they are closed by tatties during the hot season, through which the air passes freely. The thermantidotes also serve to renew the air in the wards, which at all times are free from odour or closeness. There are no jalousies or jhilmils.
7. The tatties used to cool the air of wards are bamboo framework, covered with the aromatic roots of a marshy grass. They are kept constantly wet, and the evaporation cools the dry wind in passing through in the hot season. The thermantidotes are machines on the principle of the blast furnace in England; they draw the air through the tatties and blow it into the ward, reducing the temperature from 120° Fahrenheit to under 80° Fahrenheit. Punkahs are used day and night to cool the patients; they are wooden frames covered with cloth with a deep fringe.
8. There is no apparatus for warming the wards. They are cleansed and whitewashed quarterly by regulation, or oftener if the sanitary officer recommends it.
9. The privies and urinals are of the same construction as those in the barracks, and are connected with the building by a covered way. The old privies were over cesspits, and were very offensive, but those now being constructed are as already described.
10. A wash-house like those in the barracks is in the course of construction, and will be sufficient for the wants of the sick.
11. There are bathing tubs for the use of the sick, which are sufficient for the purpose and convenient.
12. The hospital clothing is taken by the dhobies, or washermen, to the river and washed, and afterwards dried on ropes. The washing is well and efficiently done.
13. The storage is sufficient and dry.
14. The cots used in the hospital are wooden frames, 6 feet by 2 feet, raised 1½ feet from the ground, and covered with newar or rope. The mattresses are 3 inches thick, stuffed with hemp and covered with red cloth; the pillows are similarly constructed. The covers and sheets are cotton, with woollen blankets or wadded cotton resais.
15. The hospital kitchen is similar to that in the barracks, and is about 60 yards to the north of the sick wards. The cooking vessels are copper, tinned twice a month, and kept in good order; they are sufficient for the requirements. The diets vary according to the orders of the medical officer.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	16. Copies of returns forwarded which are required for working the internal economy of the hospital. 17. Besides the regular subordinate hospital establishment of apothecary, steward, assistant apothecary, and hospital apprentices, and the native establishment of compounders, dressers, coolies, &c., there are no regular hospital nurses or orderlies. In special cases soldiers are allowed to act as orderlies, and particularly when restraint is required, or the patient is dangerously ill. The duties of the hospital serjeant are confined to the discipline of the patients. When the medical officer cannot speak the language of the natives, he is much at the mercy of his subordinates, and this should be avoided. Every medical officer should pass the colloquial examination before receiving charge of a corps in India.

Regular Establishment for an European Corps.

Apothecary	1	Head Cook	1
Steward	1	Ordinary Cooks	4
Assistant Apothecary	1	Head Washerman	1
Hospital Apprentices	3	Ordinary ditto	4
Head Writer	1	Head Bheestie	1
Head Compounder	1	Ordinary ditto	6
Assistant ditto	1	Head Ward Coolie	1
Head Dresser	1	Ordinary ditto	20
Assistant Dresser	1	Head Sweeper	1
Shop Coolies	2	Ordinary ditto	8
Clothier	1	Nurse	1
Steward's Servants	2	Female Sweeper	1
Barber	1	Head Dhoolie Bearer	1
Tailors	2	Ordinary ditto	10
	19		79

Extra in Hot Seasons.

Bheesties	34
Coolies for Tatties	23
Coolies for Punkahs	104
	161
Regulars	79
	240

18. The hospitals are kept clean and well ventilated, and as free from disease as ground-floor hospitals of this construction can be. No hospital gangrene or pyœmia have appeared in them.
19. All tropical hospitals should be two-storied buildings. Privies and wash-houses are in progress of being built, and the ground levelled and the drainage improved.
20. Convalescents are taken out morning and evening on elephants, and occasionally in the dhoolies for exercise. No trees or shaded walks are allowed near the hospital; the compound enclosed being a bare grass field, green in the rainy season, and brown during the hot season. There are seats in the verandahs, and arm chairs for the use of the patients.
21. There is a female hospital adjoining the general hospital, with female servants, for serious cases. Slight cases are treated in the barracks. The present arrangements for the attendance on the soldiers' sick wives and children are satisfactory.
22. There are no special local hospital regulations not included in the general Presidency Medical Regulations.
23. The sanitary state of the hospitals is entirely under the authority of the medical officer, under the supervision of the sanitary officer of the station. His requisitions regarding repairs are attended to, and if necessary enforced by the requisition of the deputy inspector general of hospitals. All changes of diet and medical comforts within the hospital are made by the medical officer. The supply of medical comforts is most liberally furnished, both in stations and on the line of march.
24. There are no convalescent wards. When free from disease, the men regain strength more rapidly under light duty in the barracks than lingering in hospital.

XIII. Burial of the Dead.	1. The burial ground for British troops is half a mile to the east of the European barracks. The prevailing winds are westerly. 2. Its area is about 100 yards square, on a light sandy soil, where water does not lodge. Decomposition takes place readily. The grounds are carefully kept. 3. The interval between the graves is about six feet, and the depth of the graves is five feet. They are not reopened. Only one body is buried in each grave. Interment is compulsory from 10 to 16 hours after death at ordinary times and during epidemics. The bodies of natives are removed immediately after death, and those of the Hindoos are burnt or thrown into the river. Those of the Mussulmen are buried. 4. The grave yard is never offensive. After death the bodies of British troops are removed to the dead house and examined by the surgeon; then put into a coffin, and taken to the burial place in the cool of the morning or evening. 5, 6, 7. The dead of the camp followers and bazaar people are burnt, if Hindoos, on the banks of the Jumna; and if Mussulmen, buried beyond the limits of the cantonments. No injury accrues to the public from the present practice. No improvements are suggested.

(Signed) John Murray, M.D.,
Deputy Inspector General of Hospitals,
Agra.

27th August 1860.

LANDOUR (CONVALESCENT DEPÔT). BENGAL.

LANDOUR (CONVALESCENT DEPÔT).

Accommodation,—Queen's Troops - - - { The barracks and bungalows will accommodate something under 200 fighting men, and these are selected from all branches of the two services annually.

Native Troops.—Infantry.—A serjeant and 25 men take the guard.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding this station is mountainous. There is less wood and jungle in the vicinity of Landour than at other hill stations. No prohibition exists for their removal for domestic purposes. The supply of water, excepting in very hot weather, has been tolerably good until the last few years. This year it has been very scanty, which is said to be due to the absence of trees in the neighbourhood of the springs.
	2. The elevation of the station above the sea is from 6,500 to 7,000 feet, and about 4,000 feet above the adjacent country. There is plenty of higher ground adjoining the station; but as to its being healthier depends upon a variety of circumstances. Its nature is mountainous and its elevation varies from 7,000 to 10,000 feet or more.
	3. No answer to this query.
	4. The Ganges and Jumna run through the Dhoon at a distance of about 5 or 6 miles in a straight line from Landour. The vicinity is not liable to overflow of water. There are immense khuds between the various mountain peaks.
	5. The station generally is open and freely exposed to the prevailing winds, uninterruptedly so in the direction of the plains. In the north-east and west it is surrounded by immense chains of mountains. The temperature of the station is not raised by exposure to reflected sun-heat. The station is exposed to winds from the plains, and more frequently, I believe, from the interior hills (the snowy range). The effect on health is beneficial.
	6. The surrounding country is very slightly cultivated. There are works of irrigation at a distance of 7 or 8 miles in a direct line.
	7. The town of Dehra is distant about 10 miles from the station.
	8, 9. No answer to these questions.
	10. There is adjacent higher ground, but the drainage does not pass into the station; it simply passes through it here and there.
	11. The water supply of the station is derived from wells; it is not stored in tanks.
	12. I cannot ascertain, with any degree of precision, the amount of the water supply available for the station; but it is not abundant, excepting in the rains. Its colour, taste, and smell are good.
	13, 14. No replies to these queries.
II. Climate.	1. There are no instruments for conducting meteorological observations, excepting those in private hands, and a rain gauge at the office of the Trigonometrical Survey.
	2. Table of meteorological observations for 10 years.

From January 1850 to December 1859.

Months.	Mean Dry Bulb.	Mean Wet Bulb.	Rain, Inches.
	°	°	
January - - -	44·25	35·83	·61
February - - -	43·33	37·57	·60
March - - -	56·76	45·88	·30
April - - - -	65·41	51·74	1·94
May - - - -	70·61	61·15	1·54
June - - - -	73·18	63·80	11·85
July - - - -	70·08	66·30	31·48
August - - -	67·68	65·65	32·32
September - - -	65·95	62·37	10·25
October - - -	56·88	50·64	·94
November - - -	49·13	41·82	·6
December - - -	44·31	37·12	·3

3. The climate of Landour like that of all hill stations is very moist for some months of the year; but I am not aware of any peculiarity in the nature of the atmosphere, excepting that due to elevation. I have only resided here during one entire season, and am, therefore, unable, satisfactorily, which are the most healthy and unhealthy months. Diarrhœa of an obstinate character, dysentery, and chest affections of children have lately been prevalent.

4. There is plenty of higher ground near the station, but there is no proof of its greater salubrity.

5. I have served at most stations in this presidency since 1842, and at several in Madras. Some of the Punjab stations, such as Rawul Pindee, and Sealkote, are the healthiest perhaps, and Meerut and Umballa are also healthy if the troops are well looked after, for much depends on this. Among the positively injurious stations at which I have served, I may mention Calcutta, Chinsurah, Berhampore, Dinapore, and Allahabad fort. The hill stations vary so much that I cannot here give the information as I would wish.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station.	1, 2. No map or plan of the station can be made out or procured. 3. Rough plans of the two barracks, with cook room, privy, &c., &c., are transmitted. 4. Table of barrack accommodation. Date of construction, 1828-30. Total number of rooms, 84 of different sizes, in 12 barracks and houses. Total regulation number of non-commissioned officers and men, 228 at present, but ever varying.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
6 Barracks—											
12 -	12	10	9½	11	12,540	1,045	95	1½ feet in all.	12	3	3½
24 -	24	10	8½	11	22,440	935	85		24	3	3½
6 -	108	50	20	16	9,600	888	55		24	3	3½
6 Barracks—											
24 -	24	14	8½	10	28,960	1,190	119		24	3	3½
12 -	36	16	14	13	34,974	970	74		24	3	3½
6 -	24	16	16	15	23,040	960	64		6	3	2½
Total 84	228										
Guard Rooms { 1	5	21	15	12½	3,937	787	63	Feet. 1¼	1	3	2
Guard Rooms { 1	2	10	15	12½	1,875	937	75	1½	1	3	2
Prison Cells 4	4	13	8	14	5,824	1,456	104	—	1	2½	2

5. The windows of the small rooms are on one side, and the doors on the other, and the windows of the large rooms are on opposite sides. The windows open in the inside, and the jalousies or venetianed shutters on the other. There are open verandahs 38 feet by 8½ feet, on both sides of the barracks. These are never occupied as sleeping quarters, but the men breakfast and dine in them. All the windows which are not protected from the weather by verandahs have jalousies or jhilmil shutters.
6. The bedsteads are wooden, with interlaced tape or Newar bottoms; a highly objectionable plan, as they harbour vermin and accumulate dust and dirt. Iron bedsteads are the best.
7. There are no tents in use here.
8. The barracks are ventilated by means of the doors and windows, placed opposite each other, and opening inwards. The ventilation is only sufficient for a part of the season, and the barracks cannot be said to be well ventilated, and are moreover overcrowded. There is no roof ventilation in some of the barracks. No means are required at this station for cooling the air of barrack rooms.
9. The barracks are constructed of stone, and lime plastered and whitewashed within and without. The roofs are thatched.
10. The floors are terraced, and generally raised about one foot above the level of the ground. Some of the rooms are approached by steps of stone.
11. The materials of which the barracks are constructed are all that could be desired. Better ventilation is wanted, but this can hardly be effected without rebuilding the whole. The barracks and cantonments are kept in repair by the Public Works Department, and I have experienced no delay in getting repairs executed. The medical officer is believed to be responsible for the sanitary state of the cantonment. The periodical repairs, whitewashing, &c., are executed annually, when the buildings are vacated by the troops re-joining their corps, and at any other time when the medical officer may deem it necessary.
12. To all the large barracks is attached a spacious washing house, furnished with brass basins fixed in a row, in a trough, but from the scanty supply of water during the dry season these are not used much, and the men wash in earthen vessels. The drainage is at each end, towards the slope of the hill.
13. Water is supplied to the cook-room by the barrack department. It is carried on mules from a distance of 1½ miles. The refuse water is drained off, as above. The washermen frequent a ghat or stream about a mile down below the barracks, where there is an abundant supply of pure running water at all times, and here they perform the washing and drying of the linen of the station.
14. The privies and urinals are properly drained. Their contents are removed twice daily by sweepers and carried away to a sufficient distance from cantonments.
15. Barracks are ventilated and lighted by doors, windows, and chimnies as formerly stated. At night they are lighted by lamps, but not sufficiently; this is to be looked to and improved.
16. The barracks being situated on the summit of a hill range, no artificial drainage is required, the natural drainage being sufficient to carry the whole of the surface water down the surrounding khuds or ravines into the numerous mountain torrents. For three months of the year during the periodical rains, every house is more or less damp; but this is obviated as much as possible by fires, &c. There are no foul ditches near the station.
17. An establishment of sweepers has this year been sanctioned for keeping the public roads and their vicinity and the neighbourhood of the barracks clean. This is in addition to the work performed with the same object by the barrack-master's department, and private householders, &c., are held responsible for their own domains and grounds.
18. The surface of the cantonment is kept as free as possible from vegetation by an establishment of men kept for the purpose. There are no old walls, thick hedges, &c., interfering with the ventilation of the station, bazaar, &c.

LANDOUR (CONVALESCENT DEPÔT). BENGAL.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station —*cont.*	19. A small establishment of sweepers is kept up from a fund produced by a light house tax, for police purposes. Native residents are besides held personally responsible for the cleanliness of the interior and neighbourhood of their dwellings. Native houses in cantonments are kept clean; but those in the neighbourhood are not remarkable for cleanliness, all the hill men of the district being filthy in their habits. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. The public slaughter-houses are a mile below the barracks, in the neighbourhood of the principal bazaar. The offal is removed and burnt or buried. There is no nuisance discernible. 21. There are few, if any, horses kept in the bazaar. Those of residents are scattered all over the station in the stables attached to private dwelling houses. The manure is frequently sought for for private gardens. 22. There are no artillery or cavalry horses at the station. 23. The married people occupy separate houses, or, in one or two instances, rooms in the barracks, but quite apart from the unmarried soldiers.
Officers' Quarters.	1. The officers at Landour live in bungalows, rented by them for the season. There are no separate officers' quarters at this station.
IV. HEALTH OF THE TROOPS.	1. The station is undoubtedly healthy, and is, therefore, used as a sanitarium for regiments on the plains by officers and their families, and by retired officers, invalids, &c. 2. Small-pox is occasionally met with in the neighbourhood. Bad fever or its effects (spleen) only in the valleys of the mountains, far from the station. Goitre is also a common affection among the hill people. 3. The healthiness of the neighbouring native population is attributable to the pure bracing climate. The natives, it is presumed, would be less liable to disease were it not for their inveterate filthy habits. They seldom wash or change their clothes. 4. The troops at present stationed here are entirely sick and weakly men, sent up for the recovery of their health at the commencement of the hot season (about the 1st of April) from Agra, Delhi, Meerut, &c. The chief diseases are fevers, liver and bowel complaints, and general debility. Very few of the men are under treatment here, except for their original maladies or accessions of them. I am not aware that any portion of the men's present accommodation is more unhealthy than the rest. 5. The troops at this station are never camped out. 6. I have been for several years with troops in the hills, viz., Kussowlie and Landour, and have visited Simla, Subathoo, and Murree (sanitaria). I think that cases properly selected do well generally at these hill stations. Fevers and diseases of the liver and bowels contracted on the plains usually recover, but rheumatism, bad syphilis, &c., get worse. 7. I have observed that diarrhœa, &c., contracted in the hills (I allude particularly to Kussowlie) never almost gets well until the patient is removed to the plains, and not then, unless the disease be taken in time. I do not think bad fever (intermittent) cases, with spleen affection, should have less than 12 or 18 months of a hill station. 8. I think the hill stations should, as a rule, be set aside for the reception of sick and weakly men, carefully selected at intervals from regiments on the plains, and not used as stations for whole regiments. I speak from experience of the fatal diarrhœa, so usually prevalent at Kussowlie, &c.; but this may have been from overcrowding in faulty barrack rooms. 9. There are no particular diseases by which troops are liable to be attacked on first going to hill stations; but in former years I have known scorbutic diarrhœa almost decimate a regiment at one station (Kussowlie). Landour is remarkably healthy, and free of that disease. 10. All the necessary precautions for preserving the health of the troops are generally enforced here, and at other stations in the hills which I have visited. To give the men fair play, they ought not to be overcrowded in barracks. 11. As a rule, from 15th March to 15th November is the best period adapted for a residence in the hills, as weakly men thus escape the hot season in the plains, but there are exceptional cases which require a cold season in the hills besides. Six or eight months is the shortest period of residence which would enable troops to obtain the full benefit to their health. 12. There is no period of residence in the hills beyond which injury is likely to be inflicted on the health of troops, except where they suffer from hill diarrhœa. 13. Ordinary precautions I have found to be sufficient, if properly enforced, for protecting the health of troops on leaving hill stations for the plains. 14. I incline to think that service in the plains, with short periods of service in the hills, is most conducive to the health of troops; but I would insist on numerous sanitaria in the hills, with the best possible barracks, &c. Troops should never be kept long in an unhealthy station, nor even in a healthy one which has suffered from a bad epidemic visitation, as they are sure to suffer in health and get reckless. On the other hand, frequent removal of troops entails great expense on the married people and on all the officers. 15. The hospitals I have visited at hill stations seemed ample in accommodation and well constructed. In some particulars the barracks, as already stated, are faulty, but chiefly from putting more men into them than they ought to hold. 16. I think an elevation of 7,000 feet on the whole would be the best for sanitaria. For regiments or large detachments of men presumed to be in health, perhaps this is too great an elevation—say, 4,500 to 6,000 feet for them. 17. Although there are higher ranges in close proximity to this station, they could not be advantageously occupied as hill stations. 18. With reference to the particular class of surface and subsoils most healthy for stations, I think limestone formations, with good natural drainage and moderately wooded, the best; but many circumstances must influence a definite answer to this question. 19. Troops should not be sent to India under 21 years of age; but from that to 25 is the best period. They should land here from 1st November to 1st February in the best season at Calcutta or Kurrachee, as many of them have to march 1,000 or 1,500 miles, and exposure in tents, even in March, does not suit any one, especially a recruit fresh from aboard ship. I do not know what is the rule now for the disposal of troops on first landing. They used to be sent at first (in Bengal) to Chinsurah, the worst and most objectionable station in the world, and then marched or sent up the Ganges in country boats. I would send recruits as soon as possible to the head-quarters of their regiments, give them no spirits, moderate

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	drill at proper hours in proper season, and attend particularly to their head-dress and clothing. 20. I think troops should be sent direct from the home depôts to India. A soldier is always better off, happier, and most carefully looked after with his own regiment. Perhaps selected cases ought to be sent to the hills on landing, but if a regiment is stationed at Meerut, and above it (I only allude to this Presidency), the recruits who land, say in October, ought to march up to join. No regiment should be stationed in Lower Bengal at first, in such stations as Calcutta, Berhampore, Ghazeepore, Dinapore, Benares, or Allahabad. 21. Detachments often proceed, 100 or 150 men at a time, by bullock train, each cart holding about six men, and travel by night about 24 miles on a stretch. Sometimes they march 600 or 1,000 miles from Calcutta to their regiments, and I think usually keep very healthy by either of these modes. Steamers with flats attached are occasionally resorted to. Country boats have been discontinued for many reasons. 22. As a rule, 10 years is quite long enough for a British soldier to serve in India, and every man ought to have a season or two in the hills out of that. 23. I have always seen medical boards fairly conducted, and therefore make no suggestions. 24. Invalids should undoubtedly leave India for home in the spring, so as to land in the finest weather, avoiding of course the bad season in south latitudes.
Diseases.	1. At the commencement of the season when the invalids arrive at this station, every man is daily examined; afterwards once or twice a week, or, if any disease prevails, oftener. 2. There has been no scorbutus or scorbutic disease among the troops at this station. 3. I find that about 12 per cent. of the cases sent for recovery this season are hepatic. The causes are the climate and exposure, with here and there dram drinking. I think hepatitis is usually, at least out of Lower Bengal, idiopathic. Plenty of healthy exercise, athletic games, &c. would diminish the frequency of liver disease. 4. No cases of dracunculus are ever seen here. 5. A good many cases of secondary syphilis and syphilitic cachexia are very improperly sent here. As a rule, they do not derive any benefit from the climate; and nodes and rheumatic affections, complicated by syphilis and mercury, get worse. Primary venereal affections are extremely uncommon here. I always endeavour to make the soldier point out the woman who he believes diseased him, and examine her. Periodical inspections for venereal among the troops is an unnecessary and filthy duty. There should be a lock hospital at every station, and the medical attendant paid. 6. The troops at this station suffer from:— *Fevers.* Usually relapses of the intermittent, quotidian, or tertian contracted on the plains, and occasionally from common continued fever, from exposure. *Dysentery.* Seldom, except as a relapse. *Rheumatism* is common enough among the men, and occasionally happens as a fresh disease. *There are no data to enable me to state what proportion admissions and deaths from the above diseases bear to the total admission and deaths. Cholera is not known here among the troops, and no case of small pox has occurred for several years. 7. Very few cases of disease of any description originate among the troops stationed here. All of the men are invalids from regiments on the plains sent here for their recovery. 8. No epidemics have prevailed here. 9. Small doses of quinine are never required at this station as a prophylactic against malarial disease. I give large doses to cases of intermittent fever in preference to small ones. 10. A dispensary for the treatment of natives would be a great advantage. All cases of contagious disease (*e.g.*, small pox) are instantly, on being discovered, sent down from the hill some miles from the station.
V. Intemperance.	1. The soldiers at this station are very temperate generally. Men of bad character are prohibited from being sent here. Very few men have the chance of drinking hard at this station. Liquor is difficult of obtaining from various causes, and the canteen and police regulations are good and strictly adhered to. Moreover, as every soldier at the depôt is looked upon as an "out-patient," none of them are allowed spirits or malt liquor even, without the express sanction of the medical officer in charge. 2. I am not aware of any fresh case of disease having been under treatment in hospital this year caused by intemperance; though doubtless many cases of outstanding hepatitis are due in some degree to that cause. There are only two or three total abstinents, and not above that number of inveterate drunkards. Drunkenness is always punished as an offence. 3. Distilled spirits are sold in the canteen to such soldiers as are allowed, by the surgeon, to procure them. They are not sold in the bazaar to the troops. The maximum allowance is two drams a day per man. The canteen is open for the sale of malt liquor only at the dinner hour, and for spirits only in the evening. No man attending hospital draws spirits on any pretence. No drinks other than intoxicating drinks, injurious to health, are sold at the canteen or bazaar. 4. I see no objection to the use of good spirits as part of the ration, and consider that, in moderation, they are conducive to the health of the troops. Of course I do not allow it to convalescents. In well-regulated canteens I see nothing deleterious to the discipline or efficiency of a corps in the consumption of good spirits by the men, and it is much better that the soldier, who in these and in all times past and present will have his liquor, should draw it openly from his canteen, with good rules and strict surveillance, than be driven to seek deleterious trash from natives or others. 5. I would not advocate, for the above reasons, the abolition of spirits to the soldier. Every regiment has a different code of laws on this subject. I would never issue spirits, however, before sunset. 6. I think the health, morality, and discipline of the troops have very much improved during the past few years that malt liquors have been so much encouraged. 7. Coffee, tea, lemonade, soda water, &c., although always procurable, are not much sought after, owing to the coolness of the climate. 8, 9. I *do not* advocate the entire suppression of spirit, but would discourage it as much as possible, substituting good malt liquor. There is excellent beer and porter brewed by

LANDOUR (CONVALESCENT DEPÔT). BENGAL.

References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	Messrs. Mackinnon & Co., close by, but the commissariat issue their own malt liquor which is occasionally bad. 10. No recommendations to make on these points. 11. The general regulations of the service for canteens are strictly adhered to. Spirits are always "drunk on the premises," the names of the men being checked by the orderly serjeant on duty. The issue of malt liquor is checked in a similar manner, but the men are permitted to carry away their allowance to the dinner tables. There are no particular bazaar regulations, merely a general order absolutely prohibiting the sale of liquor of any kind to soldiers, and there is every reason to believe that the order is strictly obeyed. No native liquor is manufactured in the station, and its clandestine introduction is strictly guarded against, and with considerable success.
VI. DIET.	1. The composition of the soldier's ration at this station is as follows:—bread 1 lb., beef or mutton 1 lb., vegetables, generally potatoes, 1 lb., tea, black and green, $\frac{5}{7}$ oz., or coffee $1\frac{3}{7}$ oz., sugar $2\frac{1}{2}$ oz., rice 4 oz., salt 1 oz., and firewood 3 lbs., throughout the year. Every article of the ration is daily inspected by an European officer with the quartermaster serjeant previous to issue, and occasionally by the commanding officer and surgeon. 2. A complete ration with vegetables (potatoes for at least nine months of the year) is provided for the troops. The soldiers have three meals daily, breakfast at 8.30 a.m., dinner at 1.30 p.m., and tea or supper at 5 p.m., varying slightly with the season. The stoppage is 3 annas and 4 pice daily. One lb. of vegetables enters into the composition of the ration, but the supply is uncertain, and not much varied. Excellent potatoes, however, are grown in abundance in the neighbourhood. 3. No improvement can be suggested in the ration, which is very good in quality (bread excepted occasionally) and sufficient in quantity. 4. The cook rooms are furnished with the usual apparatus for boiling, stewing, and grilling, and occasionally baking may be accomplished. The kitchens are clean, and pretty well ventilated, but the cook boys are filthy in their habits and persons. The cooking is properly done and sufficiently varied, and tea and coffee are properly prepared for the men. 5. The establishment of gardens for the cultivation of vegetables by soldiers would be advantageous, but the scarcity of water here is a great drawback. Moreover, the men are weakly, and not here long enough to take much interest in horticultural pursuits, although there are a few plots of vegetables, &c., about the barracks.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The dress which is the ordinary costume of the soldiers varies with the season. There are no arms or accoutrements of any kind. The dress, as enforced by the military and medical authorities, is suitable to the climate and the soldiers' duties by day. There are no night duties at this station. I think the introduction of the khakee or drab colored loose tunic for the hot weather leaves little to be desired. This with a felt or other light helmet properly constructed, and further protection to the head by folds of cloth round the helmet as a turban, is most suitable. I strongly advocate a flannel shirt at all times, as it is cool in summer, and with other clothing adapted for night duties in cold climates. Of course cleanliness would have to be looked to. I think the men's boots are generally as badly made as possible.
Duties.	1. It would, perhaps, be desirable to drill the men at home before sending them to India, but not at any intermediate station. 2. The men in tolerable health here are marched round the hills (about 2 miles) daily. There are no drills, only an occasional commanding officer's instruction parade. The best time for drill is before breakfast, except in the winter months. The men have 7 nights in bed during the week. 3. A guard without arms is mounted daily. There is also a guard of a corporal and 4 men whenever there is a prisoner, which is rare. There are no roll-calls.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation at Landour: a first-rate ball court; 3 skittle grounds, and another one in course of construction, a schoolroom for children only, attended by a few soldiers daily, a good library well supplied, and also a theatre, but not much frequented. There are no reading rooms, day rooms, soldiers' gardens, workshops, or gymnasia. The climate is usually so good that the men are much and advantageously in the open air. No restriction on the men as to exposure to sun and rain is required in this climate. 2. A good and well looked after reading-room would be advantageous. 3. I do not think it would be of any use to institute soldiers' savings' banks away from the regiments. The regimental savings' banks are open to soldiers at the depôt. 4. The men are not allowed to stray far from the barracks during the hot season.
IX. MILITARY PRISONS.	The sanitary state of the military prison at this station is very good. It is well ventilated, and heated by a stove for winter use; but the cells are very seldom required.
X. FIELD SERVICE.	1, 2, I think there has been some improvement latterly in the working of the powers of medical Officers, and in a good regiment, with a reasonable commanding officer, I cannot conceive how a medical officer's powers can be merely nominal. But this is too wide a field for discussion, or even to touch on in this place or space. 3, 4. These questions do not apply to this station.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.
XII. HOSPITALS.	1. A rough sketch of the hospital is transmitted. 2. It is built on an elevated ridge open to every breeze, and it is about $\frac{3}{4}$ mile from the nearest, and $1\frac{1}{4}$ from the farthest barracks. It is 2 miles from the bazaar, and 500 to 700 feet above it. There are some private houses in the neighbourhood, but they in no way interfere with the hospital. The site is remarkably free and open, and in all respects healthy and unobjectionable. 3. The water supply suffices for culinary drinking and for ordinary ablutions, but as it is only to be had during the dry season from springs situated a considerable distance down the hill, general bathing is not obtainable. A tank might be constructed probably with advantage.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	4. The surface water flows right down the khuds or ravines, on either side of the buildings. No water can lodge. 5. The lowest wards are raised about 2 feet above the ground, and there is a free circulation of air beneath the floors. Water is conveyed from the roof by tubes aided by the slope, and it quickly drains away down the ravines. The surface drainage, &c., is sufficient at all times. The hospital is built of stone and lime, plastered and lime-washed within and without. The roof is terraced, and of composition, and pitch, and cloth (I believe). It is double and sufficiently thick to keep the place cool. A verandah 8½ feet wide runs along the north-east front of the hospital. There are none behind, but outhouses and small wards suffice to protect that from exposure to the weather. They are sufficient for the purposes required; moreover, the verandahs all have chicks or screens to shade from glare, dust, &c. The verandahs are never used for the accommodation of sick, convalescents, or others. The hospital consists of one flat.

TABLE of HOSPITAL ACCOMMODATION.

Date of construction, 1846.

Total number of wards 4 (2 large and 2 small, with several small closets for select cases.

Total regulation number of beds 60 at a stretch, 50 with ease.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.*				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.			Feet.		Feet.	Feet.
No. 2 - -	16	23	18	17	14,962	935	53	1¾	4	4	3
„ 2 - -	44	67	18	17	42,525	996	55	1¾	16	4	3

The hospital is very well placed in respect to the prevailing winds. The glazed windows open on the inside, and the Venetian shutters or jhilmils on the outside.

6. The wards are ventilated by ventilators in the walls under the eaves, and this, together with the ventilation by doors, windows, and chimneys, is sufficient.
7. The air is cool enough at all times, without the aid of any apparatus. There are double jhilmils.
8. The wards are warmed by means of open fire-places, two in each ward. Wood is used for fuel solely. The walls and ceilings are cleansed and lime-washed once a year or oftener if the surgeon deems it necessary.
9. The privies are properly drained, and there is never any offensive odour; lime and charcoal are used to obviate this.
10. Brazen vessels filled from a trough placed above them are used for washing the sick; but at times the water supply is scanty, and the patients wash in smaller vessels.
11. The sick resort to this washhouse, or if forbidden they have the water brought to them, and this is sufficient. There are of course portable warm baths, &c.
12. The washing and drying of the linen are done down the hill at the ghat referred to in a former paragraph, and it is quite sufficient.
13. The storage is sufficient and dry.
14. Wooden bedsteads with tape bottoms, as in barracks, and a few rattan bottomed are in use in the hospital, also double inclined cots for particular cases. All cots should be of iron. The bedding is very good and supplied yearly on indent.
15. The hospital kitchen is well situated, contains every requisite, and the diets for the sick can be sufficiently varied.
16. Copies of diet tables, diet rolls, &c., are transmitted.
17. There is a hospital serjeant selected by chance, or rather by necessity, for the hospital, from the sick men on their arrival. This is a great grievance and has been repeatedly, but fruitlessly, represented. There ought to be a permanent hospital serjeant at an invalid depôt, as there are serjeant-majors and quartermaster serjeants *en permanence*. Orderlies can be obtained from barracks to wait on particular cases, and there is usually one standing orderly to help the serjeant. There are no nurses.
18. The hospital has been remarkably free of any disease or epidemic as far back as I can ascertain.
19. A separate building for female patients has been applied for, and will, I hope, be sanctioned. The hospital and its appurtenances are very good indeed.
20. Weakly men are carried out for air in sedan chairs (janpans). There is very little available ground for exercise from the position of the buildings, but such as there is has been appropriated for the purpose, and furnished with benches. There are good roads round the hills for all the men to walk about on.
21. Soldiers' sick wives and children are of course treated at the hospital, but are obliged to be taken into a spare ward.
22. As the men stationed here are considered out-patients, they are exempted from all parades and duties at the discretion of the surgeon, but otherwise there are no special hospital regulations.
23. The medical officer, with respect to the sanitary state of his hospital repairs, diet, medical comforts, &c., is very well off at this station, as every man at the depôt is supposed to be an out-patient, and no parade or duty can be held without his consent as regards time, duration, &c. Every wish or suggestion of the surgeon is attended to by the military authorities. The buildings are, of course, more under the barrack department, and are periodically looked to, but most suggestions emanating from the medical officer regarding them are quickly carried out.
24. A man discharged from hospital does nothing but attend as a convalescent until he is deemed recovered. There is no necessity for a convalescent ward.

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References to Subjects and Queries.	REPLIES.
XIII BURIAL OF THE DEAD.	1, 2. The burial-ground for British troops is in the station, but in a suitable secluded situation on the north side of the hill, and below the barracks. The wind seldom blows towards the barracks. There is a separate cemetery for Roman Catholics still farther down. The area of the former ground is about 4 acres, with a soil and subsoil similar to that of the neighbourhood. The drainage is natural and sufficient towards the ravines below. The ground is very slovenly kept, as is the case in nearly every burial-ground I have seen in India. 3. The space allowed for graves is ample, with a proper interval between each. Graves are about 6 to 8 feet deep, and are never re-opened as far as I know. Interment, as a rule, takes place in about 24 hours after decease, but not of necessity so quick in this climate. 4. The above is both regulation and practice as regards the burial of British troops. The graveyard is never offensive. 5. The dead of camp followers and bazaar people are burned or buried according to caste. 6, 7. No injury is known to accrue to the public health from the present practice, nor can any improvements be suggested.

(Signed) F. H. CRAWFORD, Captain 98th Regiment, Commanding Landour.
L. C. STEWART, Staff Surgeon in medical charge, Landour.

1st November 1860.

N.B.—The answer to the questions under the head of topography, and as far as question five, "climate," have been given by Assistant Surgeon Jones, in medical charge of the neighbouring station of Mussoorie, where there are, however, no troops located. The book of questions was, it appears, transmitted to him in mistake, and after he had filled in the questions, so far as indicated, it was sent to me for completion. I am likewise responsible for the answer to question five, "climate."

L. C. STEWART, Staff Surgeon in medical charge, Landour.

Landour, 1st November 1860.

DARJEELING.

Accommodation { British Troops, Infantry, about 115 or 120 convalescents.
Native Troops, Infantry, 210 Sebundy sappers and miners.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is mountainous and sandy. There is much forest and low jungle, but no water save that from springs. 2. The station is 7,000 feet above the level of the sea, and about 6,000 feet above the plains. The nearest river of any size is the Great Rungeet, 12 miles from the station by road, but about four miles in a direct line. There are many higher hills near the station, but much too high for military purposes. 3. The station is situated on the western side of a mountain, surrounded by much more elevated mountains at a considerable distance. 4. The nearest water is the river already mentioned. The vicinity of the station is not liable to overflow of water. There are numerous ravines and water-courses near the station. 5. The station itself is pretty well cleared of jungle and forest, and is open and freely exposed to the winds, though there is much forest at a short distance, which does not interfere with the free circulation of the air. The temperature is not raised by reflected sun heat. There is comparatively little wind; it chiefly blows from the south and south-east. Its effect is beneficial. 6. The surrounding country is considerably cultivated up to 7,000 feet, but there is much uncleared ground. There is no irrigation. Rice is only cultivated in the valleys many miles from the station, and cannot affect the health of the station. There is no indigo, flax, or hemp in the neighbourhood. 7. The native town is close to the station, and contains about 1,500 inhabitants. 8. As regards the local geology, the rocks are generally gneiss. The subsoil is clay covered by sandy soil and vegetable humus. The station occupies new ground. It was covered with forest before it was built on by the Indian Government. 9. Water is obtained entirely from springs. 10. The rain water, and water from springs, flows rapidly away. Half an hour after a heavy fall of rain the station is dry and clean. There is no higher ground, the drainage from which passes under the station. 11. Water for use is derived from springs. It is not stored in tanks. The springs at the beginning of the rains are polluted by surface drainage, which percolates through the decayed vegetable matter on the ground and is consequently unwholesome. 12. The springs in and near the station are numerous, many of them are permanent and afford an ample supply of water during the whole year. The water is exceedingly pure, and fit for photographic purposes without distillation. The most careful analysis has only discovered traces of iron and lime. Some of the springs contain a considerable quantity of the sesquioxide of iron. These are used medicinally. The chief is the Soontook spring, used by the Government for invalid soldiers. There is an ample supply. 13. The station should be kept clear of low jungle, or as the population increases there will be considerable sickness. 14. As regards the selection of stations, in the Medical Code, edition 1851, I can find no directions as to how or by whom stations are selected. For the selection of stations men of known ability should be appointed. The station of Suichul, which has not yet been occupied, although barracks for a regiment have been built, is about 1,000 feet above that of Darjeeling. The site was, I believe, chosen by the executive engineer. I heard of no inquiry being made as to its climate or sanitary condition. In selecting stations I would suggest a committee composed of the chief civil authority, the chief military authority, the deputy inspector-general of hospitals, and the medical officer in medical charge of the locality, to report on the site of any proposed new station.

References to Subjects and Queries.	Replies.
II. Climate.	1. There is an observatory here containing a good set of instruments, in charge of the civil assistant-surgeon, with a writer to take the observations, which are registered four times in the 24 hours. 2. The three years I have taken in the following table give a fair average account of the climate, It is remarkable for its equability of temperature. The greatest variation in any 24 hours is only 12° F. The average temperature for the year is about 53° F. There is necessarily a good deal of mist and fog in the rainy season, but the quantity has considerably diminished since the hills have been cleared of jungle for the cultivation of tea, coffee, &c.

Three Years' Observations from January 1857 to December 1859.

Months.	Barometer. Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry	Mean Wet.	Mean Sun Temperature.	Rain,* inches.	Winds. Direction.	Winds. Force.†	Days of Sunshine.	Remarks, Clouds, Dew, &c.
	in.		°	°	°	°	°	°					
January -	23·163	45·05	4·4	50·39	38·68	43·94	41·25	91.	·04	E.W.&N.E.	3·32	20	Hoar frost.
February -	·144	43·41	4·3	50·98	38·79	44·78	42·99	92·	2·52	E.W.&N.E.	7·30	17	Windy.
March -	·140	51·45	5·3	57·17	45·57	50·98	48·15	101·4	1·80	E.W.	15·76	22	„
April -	·124	56·04	5·4	60·43	49·70	53·85	51·43	101·1	4·09	E.W.	18·73	15	„ and thunder.
May -	·073	58·21	4·4	62·99	53·13	58·17	56·44	102·	8·45	E.W.	16·81	14	Fine and mild.
June -	·022	61·16	3·3	64·50	57·66	60·76	59·73	103·	20·94	E.W.&S.W.	12·80	8	Rain and fog.
July -	·022	61·28	2·9	64·39	57·97	61·46	61·00	104·	30·14	S.E.	13·66	6	„ „
August -	·056	61·35	3·1	64·97	57·85	61·47	61·41	99·	31·81	E. & S.E.	7·19	10	„ „
September	·125	60·84	4·2	64·51	56·42	60·25	59·15	101·9	14·16	S.E. & S.W.	7·49	12	„ „
October -	·183	55·60	4·5	61·07	50·40	56·64	52·49	96·1	7·68	E. & W.	1·51	17	Clear.
November	·212	50·77	5·8	57·04	44·54	50·47	46·99	95·8	·43	E.W. & N.W.	·62	16	„ hoar frost.
December	·184	45·30	5·6	51·60	39·22	44·05	41·86	89·9	·50	E.W., S.W.	·68	10	„ „

* The average rain fall in 7 years is 124 inches a year. † Calculated on Lambert's formula.

3. The climate, as stated above, is temperate and damp. Its influence on the convalescent depôt as regards cases of fever of the remittent and intermittent types caught on the plains, or in those of simple debility, is beneficial. In cases of such organic disease as that of the lungs, liver, or intestines, I mean serious organic disease of these viscera, the climate is not beneficial; neither is it beneficial in rheumatic cases.

The clothing worn should be chiefly woollen. The duties are light. Every convalescent should be provided with a complete suit of waterproof. I think May and June are the most unhealthy months at the station. The springs have generally become low, and are only supplied by the first showers of the lesser rains. The water percolating through the decayed vegetable matter of the previous nine months is rendered more or less deleterious, hence diarrhœa is somewhat prevalent in these months.

4. Already answered in a report I wrote to the Royal Commissioners some months ago.

6. I have served at Dum Dum, Muldah, and Minghyr. This is by far the most healthy station I have been at in India, indeed the healthiest spot I have ever lived in, either in Europe or India. Assistant-Surgeon Maclean says, "No where and at no time have I ever seen troops so healthy as were ours in the Crimea during the winter and spring of 1855-56." The only climate I have served in which I should consider really injurious to health is that of Bengal during one half of the year at least.

III. Sanitary Condition of Station.

1, 2, 3. Sketches.

4. The following table gives the barrack accommodation:—

Two barracks built in 1854; one barrack built in 1849.
Two large rooms to each barrack, and four non-commissioned officers' rooms at the ends.
Total accommodation, 112 non-commissioned officers and men.

Barrack Rooms.	Regulation Number of Men per Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area per Man.	Height of Beds from Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.			Ft.	Ft. in.		Ft.	Ft.
No. 1 Barrack, 2 rooms - -	18	51	21	14	29,988	803¼	57½	1 9	24	9½	4
No. 2 Barrack, 2 rooms - -	18	51	21	14	do.						
No. 3 Barrack, 2 rooms - -	18	51	21	14	do.						
No. 1 Married Barrack, 18 rooms -	2 rooms to 1 family	each 10	9	14	2,520	1,260	90	„	2	10	4
No. 2 Married Barrack, 10 rooms -	do.	11	10	13	2,860	1,430	110	„	2	9	4½
Guard-room, 1 -	—	23	16	10	3,680	—	—	—	3	3½	3½

The present cells are condemned. New ones are estimated for.

Sebundy sappers and miners. Strength of corps:—

2 subadars.
4 jemadars.
180 sepoys.
10 hav.
10 naicks.
2 buglers.
2 kelassees.
2 bheesties.

The men arrange about their huts amongst themselves. The huts are all of different dimensions. Average size about 10′ × 10′. No windows. Only doors and ventilating holes in the walls.

DARJEELING. BENGAL.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. The barrack-room windows are on opposite sides, and open in the centre. There are verandahs 14 feet in width on both sides. Those on one side are glazed. There are no jalousies or jhilmils. The verandahs are never occupied as sleeping quarters. 6. The cots are the same as those used in barracks, cane-bottomed, about 2 feet high. The bedding stuffed with hemp. 7. No tents are used at Darjeeling. 8. Ventilation by doors, windows, and chimneys. No roof ventilation. The present ventilation is not quite sufficient. No means are used for cooling the air. 9. The barrack walls are built of thick solid brick and mortar. Floors are of wood, and roofs shingled. 10. The floor is raised about 2 feet above the level of the ground. There is not a very free passage of air beneath. 11. Barracks and cantonments are kept in repair by assistant executive engineer and barrack-master. Lime-washing is done once a year. 12. There are eight bath-rooms, each 8 feet square, to each barrack building. A good supply of water is obtained from a spring close at hand. The refuse water is carried off in open stone drains. 13. There is a cook-house to each barrack building, small, and very badly lighted. Good water from a spring close at hand. Refuse water carried off in open stone drains. 14. The privies are fitted up with seats, beneath which are placed portable vessels, their contents being taken away daily to a distance, and buried in deep pits. The privies are used as urinals by day, but at night the portable barrack utensil is used in the barracks. 15. These buildings are ventilated by small apertures in the walls. The doorways are open, having merely a wall of masonry a few feet in front of them as a screen. The privies are lighted up at night with oil lights secured in a glazed lantern. 16. The drains of the barracks are all constructed of stone, and are open. The greater portion of the refuse water and filth is washed away down these drains. The remainder is taken away daily to a distance, and thrown into cesspits. The drainage of the depôt is, in the opinion of the medical officer, defective. The upper married barrack at this depôt is damp, on account of its situation; and the others, viz., three single barracks and another married one, are also damp, their roofs being old, and leaky during the rainy season. The roof of the hospital is also in a bad state of repair. Part of the fluid refuse of the barracks sinks into the subsoil, and the remainder goes a short way down the hill in the open drains, except that from privies and urinals, which is taken away daily to a distance, and thrown into pits constructed for the purpose of receiving it. These pits are two or three hundred yards off from the nearest men's quarters and hospital. Sweepers collect the filth every morning, which is taken to a distance and thrown into the cesspits, a layer of earth and lime being placed over it. When the pit is filled up a new one is constructed. There are no foul ditches now near the depôt. 17. The surface cleansing is done by the conservancy establishment. As to the mere surface cleansing within the cantonment, it is performed satisfactorily enough. The refuse and manure, except what of these enters the subsoil, are removed daily outside the cantonment. 18. The surface of the cantonment is kept free of vegetation. There are no old walls, thick hedges, &c., interfering with the ventilation of the station. 19. As regards the sanitary condition of the bazaar, it is well drained, but the huts and native buildings generally are too near together to admit of free ventilation. The Government bazaar is good and well kept. The bazaars are swept by the prisoners. The native houses are built mostly of mats and bamboos, and are generally surrounded by all kinds of filth. The medical officer states that these are the most filthy villages he has ever entered, and so impure is the atmosphere in them that it is quite sickening to walk through any of them. The depôt is fortunately placed at too high an elevation in regard to these villages, and at too great a distance from them, to be injuriously affected by their sickening effluvia. 20. On my arrival at this depôt it was the custom to slaughter animals within the cantonment; since that time the practice has been put a stop to. 21, 22. There are no stables nor picketing grounds. 23. At present the accommodation for married non-commissioned officers and men is, as regards mere space, sufficient. None of the single barracks are occupied by married people.
Officers' Quarters.	1. The difference between the sanitary condition of officers' quarters and that of the non-commissioned officers and men is, that the former are better lighted and ventilated, and, as regards the individual, more spacious than the latter. Both the officers' quarters and those of the men are leaky. They require to be put in a state of proper repair.
IV. HEALTH OF THE TROOPS.	1. The station is healthy. 2. The most prevalent diseases among the native population are small-pox and fever, and some cases of spleen, but it is not a very frequent disease. Small-pox is the scourge of the hill population; Europeans are seldom attacked. Goitre is also a very common disease. 3. The people (Lepchas, Booteas, and Nepaulese) are generally healthy and strong. They live very much in the open air, are not crowded together in large villages, and all generally well clothed and fed. 4. The convalescents usually arrive here from the plains in April; and such as have been invalided, or have been pronounced fit to rejoin their regiments, leave this in December. These belong to different regiments, and suffer, the greater number, from fever, ague, and remittent; hepatic, pulmonary, and intestinal disease; syphilis, rheumatism, and ophthalmia. No portion of the station is more unhealthy than the rest. 5. The troops are not camped out here. 6. I am at present in medical charge of the Darjeeling sanitary depôt. My experience of its climate on the health of convalescents I have given to the Commissioners in the report already alluded to. 7. No information. 8. I approve strongly of hill stations for European troops, and am quite of the same way of thinking as Mr. Jeffreys is on this subject. 9. There are no diseases peculiar to Darjeeling, but I believe there are at some of the other hill stations.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	10. As regards precautions, all convalescents sent to the hills should, on their arrival there, be provided with good warm clothing; a blanket suit for each man would, I think, be as good as any. Suitable amusements should also be provided; and, as regards duties and exercises, these should be regulated with a strict regard to health and efficiency. Every man should also have given him a complete waterproof suit on his arrival here. 11. The period during which convalescents recover best on the hills is from the time when the rains cease until they recommence, and from about the 1st October to the middle or end of May. For healthy troops, if those in Bengal can ever be called so, the hills would at all seasons be suitable as a residence. The question as regards the duration of residence must be answered according as to whether the troops are in a tolerably good state of health, or very sickly, on their arrival in the hills. If they are in the former condition, a residence of six or twelve months might be sufficient. If in the latter, one of one or two years would in general be necessary. 12. I do not think that there is any period beyond which residence on the hills would be injurious. A transition climate would, I think, be best for men sent from the plains, say one at an elevation not under 4,000 feet, and not exceeding 6,000 feet above the level of the sea. 13. On leaving the hills men should be gradually moved down. On proceeding to the hills sickly troops should on no account be forced to march on foot up till a late hour in the day during the months of March and April under a blazing and destructive sun. The more weakly portion should be amply provided with proper conveyance. This year, the first sick from the plains arrived here on the 15th April, much worse for a journey so late in the year. Four of the party died on the march, and two immediately after its arrival here. 14. As regards the proper use of hill stations. It would most certainly be most conducive to health to locate the troops in hill stations, with short periods of service on the plains. It would not, in my opinion, be advantageous to locate them on the plains, with short periods of change to hill stations. Frequent change of station in the plains is beneficial. 15. The barrack and hospital accommodation at Darjeeling is not sufficient for health and comfort. I have spoken at some length on this in the report to your Commission mentioned above. 16. The best elevation for hill stations is from 5,000 to 7,000 feet. Certainly not above 7,000 feet or below 4,000. 17. There is no higher or healthier ground near this station. 18. I have not observed the influence of particular classes of soils on health. 19. With reference to the best age for troops coming to India, the younger they are, I believe, the better. The best time for arrival is the beginning of the cold weather. The precautions necessary on arrival are to prevent altogether, if possible, over-crowding, needless exposure to the sun, and to trying extremes of temperature; also drunkenness. The dress should be suited to the climate and duties, and not fashioned after any pattern got up to satisfy wrong-headed ideas about appearance, at the expense of health and efficiency. 20. I think that sending fresh arrivals to hill districts, and bringing them down again to the plains after some little time, gradually, would be advantageous. 21. No reply. 22. As regards the number of years soldiers should serve in India, I am an advocate for European regiments being sent to the hills, say every two years, and for their hill service being equal, at least, in amount to their plain service. If the soldier is to be kept altogether in the plains, of Bengal especially, five years' Indian service would, I think, be ample. Ten years' service would be all we could expect from men who have served five of these in the hills. 23. As regards medical boards, the recommendation of the regimental surgeon and of the District Invaliding Committee should, in the cases of non-commissioned officers and soldiers, be acted upon at once, and not left to be adopted or rejected by the general invaliding committee. The recommendations of invaliding committees held at convalescent depôts should, of themselves, be final. 24. Invalids should leave India so as to be at home by the commencement of the summer weather.
Diseases.	1. There are inspection parades for the discovery of disease once a week. 2. I have not seen a case that I could call distinctly scorbutic at this depôt. 3. No answer regarding hepatic disease. 4. No dracunculus among Europeans. 5. Venereal disease. No answer. 6. Ague and remittent fevers occur, but they are brought up from the plains. Dysentery is also imported. Cholera has never occurred as far as I know. Small-pox. Although this disease is rife in all the surrounding country, and two of my own native hill servants got it, of which one died within the last few months, on referring to the annual returns from 1848, the date on which the depôt became established, until the present time, I can find no admission to hospital from this disease. Rheumatism. There is a good deal, but then it is also brought up from the plains. The following are the admissions and deaths from these diseases:— Fever - - - - Admissions 31 - - Deaths None. Dysentery, acute - - „ 6 - - „ 1. „ chronic - - „ 8 - - „ None. Rheumatism - - - „ 6 - - „ None. Although there were only six special admissions in men suffering from rheumatism, a great many cases suffering from other diseases under which they were admitted, were also suffering from rheumatism. There were only two more deaths last year at the depôt, viz., one from acute hepatitis, and one from acute bronchitis. 7. With reference to nosological character, the more frequent zymotic diseases at this depôt are ophthalmia, dysentery, diarrhœa, ague, rheumatism, syphilis of the secondary kind, tape-worm. These diseases are chiefly of a chronic nature, and, except the last, are very difficult to cure, chiefly from their long standing. The predisposing personal causes of epidemic disease among the native population are their exceedingly dirty habits. The Lepchas and Bootiahs seldom change their woollen clothes or wash themselves. 8. The monotony of a soldier's life in India, and the harassing nature of many of his objectless

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops: —*Diseases—cont.*	duties; his aversion to bestir himself to exertion that might be beneficial, and his want of incentive to do so; the discomfort of an overcrowded and unhealthy barrack room, where secrecy being impossible neither the decencies of life nor the duties of religion can be observed as they should be; his notorious tendency to exceed in the use of strong drink, arising in a great degree from the misery of his condition; the general depression produced in him by these and other causes,—all tend to render the British soldier in this country, as in others, more than any one else liable to be seized upon and overpowered by epidemic and other morbid influences.—A.M. 10. To prevent the occurrence, as well as to mitigate the violence, of epidemic onsets, the best plan would be to promote the health of the troops by every means in our power. These means, although quite within our reach, have hitherto been sadly neglected, and so are they likely to remain until those in power have both the knowledge to appreciate, and the humanity to carry out, the invaluable but unvalued recommendations of military medical men.—A.M.
V. INTEMPERANCE.	1. The soldiers of this station are temperate.—A.M. 2. There are no admissions to hospital occasioned either directly or indirectly by intemperance.—A.M. 3. Distilled spirits are sold at the canteen. The quality is, I believe, what is called "good." Each man at this depôt not attending, or in hospital, is allowed to drink by purchasing it, two drams of rum 24 U.P., or instead of this quantity of rum, one bottle of day (?) and one glass of rum 24 U.P. Spirit is not given as a ration to convalescents.—A.M. No drinks, other than intoxicating drinks, injurious to health, are sold at the bazaars that I know of.—A.M. 4. I have no hesitation whatever in saying that the consumption of spirits by troops is decidedly and highly injurious; and as far as I can judge, I should say that it is anything but conducive to the efficiency and good order of a corps.—A.M. 5. It would, without doubt, be beneficial to abolish altogether the use of spirituous liquors as part of the ration, as well as its sale in canteens. A sudden abolition might, however, be attended with some degree of danger as regards discipline, or even health, for the men might go and get worse liquor elsewhere than that sold in the canteens, but this is no reason why the abolition should not prove perfectly safe, if carried out gradually and wisely. One thing is certain, that by getting rid of this pernicious habit of drinking in the army, you get rid of much of that sickness and inefficiency, as well as of much of the mortality, crime, and misery in it, which at present owe their origin and aggravation to this habit. The soldier would not be such a drunkard, I am inclined to think, but for his condition. Better that condition, and then there will be some hope of making the British army a sober one.—A. M. 6. Wines, malt liquors, and spirits are all of them about equally injurious when taken in excess, but the use of malt liquor in a corps is not likely to be on the whole, I think, attended with such bad effects as ardent spirits would be.—A. M. 7. Tea, coffee, lemonade, &c., are, I think, not much used at this station. Instead of there being any comparison between the use of such drinks on health, and the use of spirits and malt liquors, there would, I think, would be a striking contrast, other things being equal, between the health and efficiency of the corps that drinks ardent spirits and malt liquor to excess and the one that is temperate.—A. M. 8. It would, in my opinion, be undoubtedly beneficial to abolish the spirit ration, no matter where a corps is serving, and to substitute in its stead good coffee and tea. 9. It would be beneficial to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, coffee, tea, &c. to be sold to the troops. 10. I would recommend the establishment in every corps and depôt of "restaurants," where the men might go and sit down to have their tea and coffee or some other harmless drink, and their newspaper or magazine to read, and where the men of different companies and regiments would have an opportunity afforded them of mixing agreeably with each other, and in which there would be the pleasant prospect of an agreeable escape from the monotony and discomfort of the everlasting barrack-room.—A. M.
VI. DIET.	1, 2, 3. The following is the ration issued to a soldier attached to the Darjeeling convalescent depôt for one week. (Darjeeling, 14th June 1860.)

Days of Week.	Bread.	Fresh Meat.	Salt Meat.	Rice.	Sugar.	Tea.	Coffee.	Salt.	Vegetables; potatoes only.	
	lb.	lb.	lb.	lb. oz.	lb. oz.	oz.	oz.	oz.	lb.	
Monday -	1	1	—	0 4	0 2½	5/7	—	1	1	
Tuesday -	1	1	—	0 4	0 2½	—	1 3/7	1	1	
Wednesday -	1	1	—	0 4	0 2½	5/7	—	1	1	
Thursday -	1	1	—	0 4	0 2½	—	1 3/7	1	1	
Friday -	1	1	—	0 4	0 2½	5/7	—	1	1	Mutton issued.
Saturday -	1	—	1	0 4	0 2½	—	1 3/7	1	1	Salt beef or pork issued.
Sunday -	1	1	—	0 4	0 2½	5/7	—	1	1	
Total of each	7	6	1	1 12	1 1½	2 5/7	4 3/7	7	7	

"The order concerning the supply of vegetables regulates that this part of a soldier's ration should be the best procurable at the different stations of the army during the different seasons of the year. But this is no reason why mixed vegetables should not be supplied at Darjeeling. Onions in considerable quantity are supplied at most of the stations in India to the European troops, and are highly recommended, particularly for those suffering from scurvy or similar complaints, and there should be a supply of them provided by the commissariat for daily issue to the men. The lb. of vegetables issued daily should be mixed if procurable."—J. BAILEY, Quartermaster Serjeant, Depôt.

"I may add that the salt meat will soon be all issued, so that the men will shortly have 1 lb. of fresh meat daily. I beg to add that mutton, in my opinion, should be issued to such men as those at convalescent depôts, the usual number of days each week (2). This

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	has been the case at this station till of late. You will perceive we only get it now once a week. This should be attended to by the commissariat officer. Hitherto it has always been served out to the men here three times per month."—J. Bailey, Quarter-master Serjeant, Depôt. "I agree with the Quarter-master Serjeant in what he says in this statement."—A. M. 4. There are cookhouses, but these are built on a very unintelligible plan, and are not what cookhouses should be, as they are not only very dark, but too small to provide against the men's food being badly or dirtily cooked. The kitchens are neither clean, well lighted, nor well ventilated. The water supply is good and ample.—A. M. Food is both boiled and roasted. Owing to the faulty construction of the kitchens, the cooking cannot be so good as it ought to be. I hear no complaints about the preparation of coffee or tea.—A. M. 5. There are two gardens attached to the depôt, but the men seem to take no interest in them.—A. M.
VII. Dress, Accoutrements, and Duties.	1. The men up here are provided with both woollen and karkee suits. I do not consider the dress as at all suitable for the plains. Mr. Jeffreys' remarks on this subject are, I think, very valuable, and I quite agree with him in thinking that the whole body should be enveloped in flannel, which is the best slow conductor fitted for a body dress I know of. The head-dress should be constructed with a reference to the properties of heat in the way that Mr. J. has suggested in his work on the British army in India. The guard dress in summer is the karkee coat and wicker helmet. I do not know whether or not a flannel shirt is worn. In the rainy season the men bring their great coats with them on guard. To protect them from the sun and rain there are sentry boxes, and what are called "shades." In winter the dress, especially when troops are on night duty, should be as warm as that worn in England at the same season.—A. M.
Duties.	1. Men should be thoroughly drilled before being sent to India. 2. As regards duties, the men here are, with only one or two exceptions, convalescents, and are all considered as "out patients."—A. M. During last winter the convalescents had only two nights in bed apiece. Now each man has about 15 or 20.—A. M. 3. There is but one guard, namely, the quarter-guard, which is within the precincts of the barracks. The guard is relieved every 24 hours.—K.R.M. There are roll calls by day about every three hours. The effect of night duty is certainly injurious, and no precautions in the way of shelter and clothing according to season should be neglected.—A.M.
VIII. Instruction and Recreation.	1. There are no ball courts. There are two skittle grounds in a very bad state of repair. One school with a soldier schoolmaster. There is a library and reading-room, both very good and well lighted at night. There is no day-room or soldiers' club. There are two gardens worked by natives. Some craftsmen, such as tailors, shoemakers, and tinsmiths, work at their trades in barracks. The carpenter is the only man who has a small workshop. There is no soldiers' theatre and no gymnasium. The means of instruction and recreation are not sufficient.—A.M. A reading-room has been established in connexion with the hospital, which answers well, and affords amusement and instruction to the patients. A reader is appointed, who reads aloud to those who wish it, as most of the men are unable to read themselves.—J.C. There is no danger up here from exposure to the sun. In the rains when the men have occasion to leave their barracks, they have been directed to put on their great coats. Each man should be provided with an umbrella besides his waterproof suit. 2. Numerous have been the means suggested both by my predecessor and myself, for improving the means of recreation and employment, without any satisfactory result.—A.M. 3. There is in every regiment a savings' bank. It is highly advantageous to the soldier. 4. As the rains here fall incessantly for five months out of the twelve (at least they did so last year), during which the men for want of outside amusements, are pent up in their barrack rooms all day and night, one might say, to the great injury of their health, there should not only be a sufficient number of different kinds of recreation provided, but these should be so got up as to allow of the men during the wet season being under cover.—A.M.
IX. Military Prisons.	1. The cells at this depôt are not now used as places of confinement, having been condemned as such by a committee assembled at my request.—A.M.
X. Field Service.	Questions not applicable to station.
XI. Statistics of Sickness and Mortality.	No replies obtainable.
XII. Hospitals.	1. Ground plan already sent. 2. The hospital is within a few yards of the barracks. The depôt bazaar is about half a mile down hill from the hospital and to the west of it. The station is about 1¾ miles distant from the depôt. The hospital is in a position far too exposed. The drainage, like that of the barrack generally, is not carried far enough down hill. There are no marshes, nullahs, &c., near the depôt.—A.M. 3. Water supply good and sufficient.—A.M. 4. A previous report on drainage referred to. 5. The ward floors are raised about two feet above the ground, there is no perflation below them. The drainage for conveying away the roof water is bad. The surface drainage and guttering is very much like that of the barracks, and insufficient for carrying away the rain fall rapidly. The walls are thick and solid, of brick and mortar. There are verandahs. The western verandah has been used for accommodating sick when the patients were compelled to leave their ward, the atmosphere of which, being surcharged with the noxious effluvium of an adjacent latrine, has been the cause of much mischief. This objectionable latrine, however, after five years writing about it, is now shut up, a new one having been built at the north-east corner of the hospital from which it is distant several yards in a direction from which the wind is seldom known to blow. The hospital is one story high.—A.M. Date of construction, 1852. Two wards, 17 men each at 1,100 cubic feet per man.

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The following table gives the accommodation:—

Wards.	Regulation Number of Beds	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Feet per Bed.	Height of Bed above Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft. in.		Ft.	Ft.
Hospital at Julla Puhar for sick of the Depôt, 150 strong, 2 wards -		53	24	15	19,080	1,100	75	1 9	4	6	4
		53	24	15	19,080	1,100	75	1 9	4	6	4
Station Hospital at Darjeeling for natives, prisoners,&c., 3 wards		50	18½	13	12,025	- -	- -	1 9	6	5	4
		23	18½	13	5,531½	- -	- -	do.	2	5	4
		23	18½	13	5,531½	- -	- -	do.	2	5	4

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The hospital, as already stated, is much too exposed. The windows open in the centre. They do well enough as ventilators, but being narrow, not numerous, and having by far too much wood in their construction, they do not admit a sufficiency of light.—A.M. 6. Ventilation is by doors, windows, and chimneys, but independently of these, there should be floor, wall, and roof ventilation. There are no jalousies or jhilmils.—A.M. 7. No means of cooling the air are required.—A.M. 8. Warming is provided for by fireplaces only. Lime washing is done once a year; too seldom. The walls and ceilings of both barracks and hospitals should be scraped also frequently.—A.M. 9. Like the other privies here, the hospital one, under the same roof as the hospital, is very badly drained; its supply of water is defective, and its state offensive.—A.M. 10. The floor of the lavatory, which is separated from the privy by a wall 8 or 9 feet high, is composed of lime and pounded brick. It is cold and smells offensively, owing to the proximity of the privy. There is no fireplace in it, nor in any of the other depôt lavatories. Several men have to wash in the same utensil, which at the barracks is made of wood, and to dry with the same towel several days running, only a very small number of towels being allowed. In fact, the inducements to remain dirty are, I think, especially in the case of sickly men, greater than those to be clean. Such a state of matters has not been left unrepresented.—A.M. 11. There are no means of bathing properly so called; these were applied for some time ago and will, it is hoped, be supplied soon. 12. The means of washing and drying hospital linen are sufficient, except during the rains.—A.M. 13. The storage is not sufficient.—A.M. 14. The bedsteads—there are no cots in use—are like those supplied to the barracks, and are far too narrow for sick men. The mattresses, blankets, and pillows, are of native manufacture of very inferior description. The former and latter are stuffed with coarse hemp, and being hard, lumpy, and furrowy, are not what even men in health should have. As to the blankets, besides being of an inferior description, they were,—last year's supply,—almost all of them worm-eaten, and had been previously in use in the plains.—A.M. 15. The kitchen is detached from the hospital. The cooks not having been numerous enough last year, nor good enough, I applied to have one more granted, and to have the wages of the head cook increased, as anything like a good cook it was impossible to get for the trifling wages offered, in a place like Darjeeling, where good cooks are scarce and highly paid. My applications were refused, and it was hinted that I should instruct the cooks myself. 16. The forms, diet rolls, &c., are the same as used in general hospitals on the plains.—A.M. 17. For attendance on the sick there is a hospital serjeant, but it is a pity that he is changed every two or three years, there should be a permanent one; there is also an European orderly and several coolies. The attendance is sufficient up here, but in the plains the majority of men not long in the country, not knowing the language of the natives, are at a great loss to make themselves understood; I would therefore recommend the appointment to each regiment of a certain sufficient number of soldier orderlies well paid, for their work is hard; this I would recommend most strongly, and also that the hospital serjeant, an important servant, should have better pay and higher rank than at present.—A.M. 18. The sanitary condition of the hospital is bad. No epidemic disease, gangrene, &c., has appeared in the wards. 19. Deficiencies were pointed out in the report of the committee which was appointed last year to examine and report upon the hospital; this report, which was forwarded to the Commander-in-Chief long since, has not as yet been followed by any satisfactory results.—A.M. 20. There is no provision for convalescents exercising. The verandahs are neither glazed nor have they wooden floors; they are, besides, quite exposed to the wind and the rain, which beat into them.—A.M. 21. Sick wives and children of soldiers are treated up here in their own quarters; this would be satisfactory enough if the married quarters were not so dark and damp as they are.—A.M. 22. No reply. 23. The powers of the medical officer, as regards the sanitary state of his hospital, as well as of the barrack buildings occupied by his regiment are, unfortunately, merely recommendatory or suggestive. Until officers of health, have, as regards the carrying out of their own suggestions, executive powers, and until Government admits that the office of a sanitary officer is not so totally worthless, as its refusal of remuneration to him would imply, there is, I believe, little hope of the army benefiting much from the application of sanitary principles, which, moreover, like their advocates, do not seem to be popular with, as they are certainly not understood by a large number of commanding and other officers.—A.M. 24. There are no convalescent wards or hospitals; they would certainly be an advantage.—A.M.
XIII. BURIAL OF THE DEAD.	1. The burial ground is distant, say, half a mile from the depôt, and perhaps 100 feet higher. The position of the burial ground is to the south of the depôt. The prevailing winds are the south-westerly and south-easterly.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	2. No reply. 3. The bodies of natives are removed and buried at a considerable distance from the station, and as soon as possible after death. 4. The grave yard is not offensive.—J.C. 5. No reply. 6. I am not aware of any injury to the public health up here from the present practice of burial.—A.M. 7. No reply.

(Signed) K. R. Maitland, Major, 19th, Comm. Convalescent Depôt.
A. Maclean, Assistant Surgeon, 42nd R. H. in Medical Charge, Convalescent Depôt, Darjeeling.
C. Murray, Captain, Assistant Executive Engineer.
J. Collins, Civil Assistant Surgeon, Darjeeling.

CHIRRAPOONJEE, KHASIA HILLS.

Accommodation - { Queen's Troops - { Infantry, one Serjeant-Major.
Native Troops - { Infantry, Head Quarters Sylhet Light Infantry.

References to Subjects and Queries.	Replies.
I. Topography.	1. The station consists of a small table land surrounded by hills on the north and west; to the east are deep valleys and glens covered with dense jungle. The surrounding country is mountainous, sandy, and swampy. There is plenty of wood, jungle, and water in the vicinity. 2. The elevation of the station above the sea is 4,118 feet, and to the bottom of the glen to the east is 3,000 feet. A deep mountain stream runs through the station. In the immediate vicinity of the station there is no higher and healthier ground, but in the interior of the hills more eligible sites for European stations can be found. 3. The whole country, more or less, is table land, but level spaces of any extent are rare. Small plateaus can be found at the height of 6,000 feet above the level of the sea. 4. A mountain torrent, with water in it all the year round, runs through the station. The vicinity is not liable to overflows. There are a number of ravines in proximity to the station, but they are not injurious to health. 5. The station is open, and freely exposed to every wind, and the temperature is not raised by the buildings being exposed to reflected sun heat. It is exposed to cold and variable winds, but we consider their effect beneficial to the health of Europeans and the natives of the hills. 6. The surrounding country is uncultivated. There are no works of irrigation; nor is the cultivation of rice or indigo carried on near the station. 7. There is a large village within one mile of the station, inhabited by independent tribes of Khasias. 8. The surface of the station is generally rocky, and where it is not so it is thickly covered with grass; the subsoil, for the most part, is composed of layers of sand, clay, and gravel, irregularly dispersed, and indurated by ferruginous cement. The ground upon which the station is built was formerly occupied by small Khasia villages. 9. No water is found below the surface. 10. The rain-fall and surface water generally flows readily away, but in some instances it lies on the surface until it evaporates. There is no higher ground adjacent, the drainage from which passes into the subsoil of the station. 11. The water supply is obtained from the mountain torrents. There are no tanks. The wells of the station are liable to pollution from leaves or other matter falling into them. There is a large pond in the station, formed by damming up a mountain stream, which, in the cold weather, from not being cleaned, emits unpleasant effluvia. 12. The water supply at the station is ample and of the best kind. It is not injurious to health. It is obtained from the mountain torrents, and no better water could be supplied. 13. The bareness of the station, and the severe storms that sweep over it, render the inhabitants of the plains who are resident here liable to diseases of the lungs and rheumatism. 14. New stations are generally selected by medical committees. The mode of inquiry suggested by Dr. Dempster is that generally adopted. We consider sufficient attention has not been paid to the healthiness of the road leading to different sanitaria; the whole attention of medical committees being generally directed to the sanitarium itself.
II. Climate.	1. The instruments available at the station for conducting and registering meteorological observations are a thermometer at the military hospital and a rain gauge. 2. The observations filled up in the following table embrace those taken by me during 12 months, from 1st March 1859 to the 29th February 1860. The temperature was noted five times each day, viz.:— At sunrise - - - in shade. „ 10 a.m. - - - „ „ 4 p.m. - - - „ „ 10 p.m. - - - „ „ 4 p.m. - - - in the sun's rays.

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Month.	Barometer mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean dry Bulb.	Mean wet Bulb.	Mean Sun Temperature.	Rain.	Winds.		Days of Sunshine.	Remarks.
										Direction.	Force.		
		°	°	°	°			°	In. cents.				
January 1860	—	56·48	8·58	60·48	51·9	—	—	69·73	—	W.	No Data.	—	No Data.
February „	—	60·09	14·58	64·68	50·1	—	—	74·	1·80	W.	„	—	„
March 1859	—	61·48	10·39	66·77	56·38	—	—	77·13	2·98	W.	„	—	„
April „	—	67·98	7·6	71·6	64	—	—	86·66	15·9	W.	„	—	„
May „	—	70·15	7·51	73·83	66·32	—	—	87·8	9·49	W.	„	—	„
June „	—	70·23	4·96	70·63	65·67	—	—	87·6	243·30	W.	„	—	„
July „	—	70·22	4·83	72·7	67·87	—	—	91·25	143·30	W.	„	—	„
August „	—	69·33	3·87	71	67·13	—	—	85·18	103·11	W.	„	—	„
September „	—	69·71	4·8	72·33	67·53	—	—	82·37	77·89	W.	„	—	„
October „	—	67·87	8·03	72·54	64·51	—	—	77·65	17·49	W.	„	—	„
November „	—	57·29	16·33	63·93	47·6	—	—	76·89	—	W.	„	—	„
December „	—	52·5	11·51	58·19	46·68	—	—	77·	—	W.	„	—	„

The following barometrical observations were taken by the chief civil assistant great trigonometrical survey from the 24th June to 7th August 1859. A copy of the barometer readings for that period is herewith annexed:—

EXTRACT of the only Barometrical Observations taken at CHIRRAPOONJEE.

Taken with Newman's Barometer. Neutral Point, 29·762. Capillary Action, + —040. Capacities, $\frac{1}{5\cdot5}$. Temperature, 32°.

Month.	Date.	Time.	Barometer Readings.	Month.	Date.	Time.	Barometer Readings.
1859.				1859.			
June	24th	10 a.m.	25·841	July	9th	4 p.m.	25·842
„	„	Noon.	·856	„	10th	10 a.m.	·942
„	„	2.12 p.m.	·829	„	„	Noon.	·941
„	„	4 p.m.	·804	„	„	2.40 p.m.	·886
„	25th	Sunrise.	·827	„	„	4 p.m.	·872
„	„	10 a.m.	·899	„	11th	10 a.m.	·950
„	„	Noon.	·894	„	„	Noon.	·950
„	„	4 p.m.	·859	„	„	2.40 p.m.	·900
„	26th	10 a.m.	·925	„	„	4 p.m.	·889
„	„	Noon.	·924	„	12th	10 a.m.	·973
„	„	2.40 p.m.	·879	„	„	Noon.	·968
„	„	4 p.m.	·856	„	„	2.40 p.m.	·947
„	27th	10 a.m.	·881	„	„	4 p.m.	·931
„	„	Noon.	·877	„	13th	10 a.m.	·969
„	„	2.40 p.m.	·825	„	„	Noon.	·953
„	„	4 p.m.	·810	„	„	2.40 p.m.	·928
„	28th	10 a.m.	·867	„	„	4 p.m.	·899
„	„	Noon.	·857	„	14th	10 a.m.	·924
„	„	2.40 p.m.	·825	„	„	Noon.	·919
„	„	4 p.m.	·809	„	„	2.40 p.m.	·883
„	29th	10 a.m.	·893	„	„	4 p.m.	·867
„	„	Noon.	·888	„	15th	10 a.m.	·927
„	„	2.40 p.m.	·856	„	„	Noon.	·922
„	„	4 p.m.	·838	„	„	2.40 p.m.	·880
„	30th	10 a.m.	·889	„	„	4 p.m.	·857
„	„	12.15	·881	„	16th	10 a.m.	·865
„	„	2.40 p.m.	·847	„	„	Noon.	·861
„	„	4 p.m.	·829	„	„	2.40 p.m.	·828
July	1st	10 a.m.	·905	„	„	4 p.m.	·807
„	„	12.30	·893	„	17th	10 a.m.	·844
„	„	2.40 p.m.	·864	„	„	Noon.	·834
„	„	4 p.m.	·877	„	„	2.40 p.m.	·789
„	2nd	10 a.m.	·905	„	„	4 p.m.	·780
„	„	Noon.	·905	„	18th	10 a.m.	·800
„	„	2.40 p.m.	·897	„	„	Noon.	·807
„	„	4 p.m.	·895	„	„	2.40 p.m.	·769
„	3rd	10 a.m.	·915	„	„	4 p.m.	·754
„	„	Noon.	·944	„	19th	10 a.m.	·847
„	„	4 p.m.	·876	„	„	Noon.	·840
„	4th	10 a.m.	·921	„	„	2.40 p.m.	·804
„	„	Noon.	·927	„	„	4 p.m.	·786
„	„	2.40 p.m.	·929	„	20th	10 a.m.	·811
„	„	4 p.m.	·898	„	„	Noon.	·803
„	5th	10 a.m.	·927	„	„	2.40 p.m.	·829
„	„	Noon.	·886	„	„	4 p.m.	·752
„	„	2.40 p.m.	·915	„	21st	10 a.m.	·791
„	„	4 p.m.	·875	„	„	Noon.	·785
„	6th	10 a.m.	·857	„	„	2.40 p.m.	·747
„	„	2.40 p.m.	·843	„	„	4 p.m.	·739
„	„	4 p.m.	·830	„	22nd	10 a.m.	·855
„	7th	10 a.m.	·882	„	„	Noon.	·856
„	„	Noon.	·876	„	„	2.40 p.m.	·808
„	„	2.40 p.m.	·825	„	„	4 p.m.	·795
„	„	4 p.m.	·812	„	23rd	10 a.m.	·829
„	8th	10 a.m.	·820	„	„	Noon.	·825
„	„	Noon.	·821	„	„	4 p.m.	·738
„	„	2.40 p.m.	·797	„	24th	10 a.m.	·710
„	„	4 p.m.	·781	„	„	Noon.	·699
„	9th	10 a.m.	·904	„	„	2.40 p.m.	·699
„	„	Noon.	·905	„	„	4 p.m.	·653
„	„	2.40 p.m.	·872	„	25th	10 a.m.	·663

Extract of the only Barometrical Observations taken at Chirrapoonjee—*cont.*

Month.	Date.	Time.	Barometer Readings.	Month.	Date.	Time.	Barometer Readings.
1859.				1859.			
July	25th	Noon.	25·658	July	31st	Noon.	25·792
„	„	2.40 p.m.	·610	„	„	2.40 p.m.	·756
„	„	4 p.m.	·594	„	„	4 p.m.	·751
„	26th	10 a.m.	·695	August	1st	10 a.m.	·861
„	„	Noon.	·697	„	„	2.40 p.m.	·821
„	„	2.40 p.m.	·663	„	„	4 p.m.	·810
„	„	4 p.m.	·648	„	2nd	10 a.m.	932
„	27th	10 a.m.	·803	„	„	Noon.	·925
„	„	Noon.	·809	„	„	2.40 p.m.	·893
„	„	2.40 p.m.	·805	„	„	4 p.m.	·867
„	„	4 p.m.	·799	„	3rd	10 a.m.	912
„	28th	10 a.m.	·874	„	„	Noon.	·912
„	„	2.40 p.m.	·817	„	„	2.40 p.m.	·877
„	„	4 p.m.	·799	„	„	4 p.m.	·851
„	29th	10 a.m.	·835	„	4th	10 a.m.	·887
„	„	Noon.	·822	„	„	Noon.	899
„	„	4 p.m.	·756	„	„	4 p.m.	·849
„	30th	10 a.m.	·821	„	5th	10 a.m.	·874
„	„	Noon.	·816	„	„	Noon.	·921
„	„	2.40 p.m.	·759	„	„	4 p.m.	·850
„	„	4 p.m.	·741	„	6th	10 a.m.	·900
„	31st	10 a.m.	·792	„	7th	10 a.m.	·975

References to Subjects and Queries,	Replies.
II. Climate—*cont.*	3. The climate is healthy, but the moisture is excessive during six months of the year. The temperature is equable during the rainy and cold seasons, however it is very foggy. Trees will not grow to any extent from want of depth of soil. There is no irrigation of any kind; no impurity of the air from dust. The air is cold but invigorating. The troops here are very healthy, as also are the European residents. They require to be well sheltered and live in houses well raised from the ground; warm clothing is also necessary. As regards drill, duties and exercise the sun is rarely sufficiently powerful to prevent Sepoys drilling in the middle of the day. The most healthy months are January, February, March, April, July, August, September, November, and December, and the most unhealthy May, June, and October. During the latter months the changes from heat to cold render the men liable to fevers and bowel complaints. 4. Districts with, it is believed, considerably less moisture than the present station, although at a greater elevation, exist at a very short distance in the interior. Experiments to ascertain this fact are now being made at a place called Woormaipoonjee, 38 miles from here, on the road to Assam, at an elevation of 5,000 feet. Its drainage is good, being situated on the summit of a hill. Subsequent to this another locality in the same neighbourhood, near Shillong, has been strongly recommended for a military station, and has been visited by a committee, and reported favourably upon. The fall of rain at this latter place has been ascertained to be not one-fourth of that which falls at Chirrapoonjee during August and September. 5. In addition to the station concerning which this report has been written, I have only served at Cachai, where a detachment of the regiment of which I am now in medical charge was located. Cachai, which is situated on the plains, was, generally speaking, considered a healthy station; but the station of Chirraponjee is, in my opinion, more conducive to health and more suited for a European constitution.
III. Sanitary Condition of Station.	1, 2, 3. There is no map or plan of the station, and no engineer resident here to make one. There are no barracks for European troops at this station. 4, 5. No replies to these queries. 6. The natives sleep on bamboo mychauns. 7, 8. No replies to these queries. 9, 10, 11. The huts are built of stone cemented together with mud, and covered with a thatch of leaves. The buildings here require to be well raised. The sepoys huts are elevated from the ground from 2 to 4 feet. The materials and construction of their huts are suitable for the climate. The barracks and cantonments are kept in repair by the barrack department; and no delay usually takes place in carrying out orders if given at a proper time of the year. Dr. Dean, of the Silhet Light Infantry, is responsible for the general sanitary state of the cantonment. The walls and ceilings of barracks are cleansed and lime-washed twice every year. 12. There are no lavatories or washing places for the men; lavation is performed in the running streams. 13. There are no barrack cook-houses. 14, 15. No replies to these queries. 16. The natural drainage is so good at this station, and in the sepoys' lines, that all surface water and filth are readily carried off by the heavy rains which fall during nine months of the year. The whole of the buildings of the station are damp as the atmosphere is always charged with great moisture. The drainage is sufficient. There are no cess-pits, or foul ditches. 17. All moveable filth is carried away by the heavy rains. 18. The cows keep down the grass; there is no other surface vegetation in the cantonment. There are no old walls, thick hedges, &c., interfering with the ventilation. 19. The bazaar is on a healthy site on the bank of a mill stream; there is no crowding and an abundance of water. Each occupant keeps the ground opposite his house clean, under the inspection of the officers of the regiment. There are no native houses near enough to the station to cause annoyance. No nuisance is experienced from wind blowing over the native dwellings.

CHIRRAPOONJEE, KHASIA HILLS. BENGAL.	References to Subjects and Queries.	REPLIES.
	III. Sanitary Condition of Station—*cont.*	20. There are no slaughter houses except those belonging to private persons. 21, 22. There are no bazaar horses, cavalry stables, or picketing grounds. 23. No reply to this query.
	Officers' Quarters.	1. Officers reside at their own bungalows, which are healthy. No improvements to suggest.
	IV. HEALTH OF THE TROOPS.	1. The station and district are both healthy and the adjoining native population decidedly so. 2. All bowel diseases are prevalent among the Khasia hill people. Small-pox and cholera are the chief epidemics, and commit great ravages among them. 3. The healthiness of the native population is to be attributed to the salubrity of the climate, owing to the elevation above swamps and consequent malaria: when visited by epidemics they are induced, and rendered severe, by the very filthy habits of the Khasias in their houses and persons; and by the bad food they consume. 4. The regiment (Sylhet Light Infantry Battalion) is a local one, and has always been stationed at Chirrapoonjee, with detachments at Cachai and Sylhet. Intermittent fever, diarrhœa, and dysentery, contracted generally by them during their periodical changes from one of these stations to the other are the principal diseases from which they suffer. All portions of the men's present accommodation are equally healthy. 5. Troops are never camped out. 6. I have been in charge of troops at no hill station but Chirrapoonjee; but hill stations are decidedly beneficial to the health of troops. 7. My experience of sepoys tells me, that when the men are not broken down from old age or excess, a residence in the hills improves their general health, and renders them less liable to contract febrile or other diseases. 8. I most decidedly approve of selecting hill stations for troops. 9. The diseases peculiar to hill stations, and to which troops are liable on going to them, are dysentery and diarrhœa. 10. In my opinion good diet, warm clothing, good shelter, plenty of duties and exercise are necessary to preserve the health of men in hill stations. 11. The seasons best adapted for residence at Chirrapoonjee are the spring and autumn; as during the heavy rains here care is necessary to prevent sickness. If in ordinary good health I think one year's residence on hill stations would be sufficient to obtain the full benefit of the climate. 12. There is no period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service in the plains. 13. No soldier should be permitted to leave the hills when labouring under sickness, or when weakened thereby; nor should troops on returning to the plains be permitted to indulge in stimulating drinks or unduly expose themselves to the sun, from whose influence their heads should be properly protected by "shola" hats; light and loose clothing should be also provided for them. 14. I consider that the location of troops on hill stations, with short periods of service in the plains, would be the course most conducive to the preservation of their health. Frequent change of station in the plains would be beneficial, but on these points, with reference to troops, my experience is limited. 15, 16. No information on the subject of these queries. 17. There is no higher ground nearer to the station than 30 miles. A place called Noormaipoonjee has been recommended for the location of European troops. It is distant from this station 38 miles. A native doctor is now stationed there making meteorological observations; since the selection of that place a plateau of level ground in a locality called Shillong has been pointed out and a committee has reported upon it. 18. As far as my experience leads me to observe, I consider a light friable soil, not retentive of water, or such a soil as that mentioned at para. 8, Topography, as the most healthy for stations. 19. Soldiers proceeding to India should be from 16 to 19 years of age, and should land in India in the month of November. Cannot say how troops are disposed of on landing, or what precautions are necessary for preserving the health of recruits. 20. If practicable, I am of opinion that if troops were sent to an intermediate station for a certain time, it would prepare them for the climate of India. 21, 22. No experience as to the mode of transport of troops from the port to the interior, nor of number of years a British soldier should serve in India. 23. As regards the invaliding of the native sepoy, I consider the habit of obliging every candidate for the invalids to travel to Calcutta a hard and unnecessary measure; they are obliged to leave from the Sylhet Light Infantry stationed here at the most unhealthy time of the year. In some instances the broken down man is killed by the trip, and in almost every case injured by it. A medical committee composed of three medical men could always be assembled on the frontier.
	Diseases.	1. There are no regular inspection parades for the discovery of incipient diseases at this station. 2. Scorbutus seldom appears among the sepoys of the regiment stationed here. 3. Hepatic disease is very rare among the troops. 4. Dracunculus is not known in this part of India. 5. Venereal disease among the sepoys bears a very small proportion to the total sick in hospital. 6. During the two years from 1st April 1858 to 31st March 1860 inclusive, there have been—

Intermittent fever	- - -	623 cases.
Remittent „	- - -	2 „
Dysentery	- - -	44 „
Cholera	- - -	4 „
Small-pox	- - -	3 „
Rheumatism	- - -	33 „

7. No zymotic diseases have been contracted at this station. The station and bazaar are always in a healthy and clean state, and the native troops are always particularly clean in their personal habits; but the native population are both in their personal habits and in their dwellings so filthy as to predispose them to many diseases.
8. Epidemic disease is not influenced by the nature of the soldiers' duties and occupations in barracks.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —Diseases—*cont.*	9, 10. Quinine has not been tried here as a prophylactic against malarial diseases, as the station is free from malaria. There has been no epidemic disease at the station.
V. Intemperance.	1, 2. The sepoys are, generally speaking, temperate; there are no confirmed drunkards. No sepoys have been admitted to hospital whose diseases were directly or indirectly caused by intemperance. 3. Distilled spirits are not sold at the bazaar; they form no portion of a soldier's ration at the station, on the march, or in the field. Spirit is never given to convalescents. No other deleterious drinks are sold in the bazaar. 4, 5, 6. I have had no opportunity of judging of the effects of the consumption of spirits on the health of European troops in India, but from my knowledge of the country I should say that total abstinence from stimulating drink would prove most conducive to the health of the European soldier. 7 to 10. The use of tea, coffee, &c. would be most beneficial to those not habituated to the use of stimulating drinks, such as spirits, beer, &c. There are no European soldiers nor any canteens at Chirrapoonjee. No recommendations to make on these points. 11. The bazaar is conducted according to the rules laid down in Section VI. of the military Regulations.
VI. Diet.	1. No reply to these queries, there being no European troops at the station.
VII. Dress, Accoutrements, and Duties. *Duties.*	1. No reply to this query. 1. No reply to this query. 2. The sepoys at Cherra are on duty one day and off one day. They are drilled as recruits three times a day, and suffer much from getting wet. Drill for the regiment is totally stopped during the rain. There are no general orders particularly regulating marching hours in these hills. The inhabitants and the Sepoys always eat before starting, and the heat of the day is never too great. The average number of nights the men have in bed is three or four a week. 3. Guards are mounted close to the lines. There are three roll-calls during the day, and on occasions of sickness four. The weather here being wet and cold, the sentries require protection from it. Night duties under these circumstances do not seem detrimental to health.
VIII. Instruction and Recreation.	1. There are no means of recreation at the station, but there is a regimental school which is pretty well kept up. There is no restriction on the men as to exposure to the sun and rain when off duty, and their health is good. 2, 3, 4. No reply to these queries.
IX. Military Prisons.	1. There are no military prisons or cells at the station.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2, 3, 4. No experience of the practical working of the powers of medical officers as regards the conduct of the line of march, &c.
XI. Statistics of Mortality.	1. No information under this head.
XII. Hospitals.	1, 2, 3. The military hospital at this station is only for the accommodation of native troops. It is in the immediate vicinity of the lines, and about 200 yards distant from them; it is at some distance from the bazaar and civil population. The site is open, freely ventilated, and healthy as to elevation, drainage, absence of malaria from river banks, marshes, or other nuisances. The water supply is abundant and wholesome. 4. The natural sloping formation of the ground upon which the hospital is built, combined with the heavy and constant falls of rain, renders artificial drainage unnecessary. 5. There is only one ward in the hospital, which is raised from the ground about 2½ feet and flagged. The roof water is carried away by a drain round the house; a portion of the drainage does, however, sink into the subsoil on which the building is raised. The rain-fall is carried very rapidly away, but as it rains here for weeks together without ceasing, a quantity of water penetrates the subsoil. The hospital is "pucca," *i.e.*, built of stone and mortar. The ventilation is deficient, there being no spaces between the roof and walls. The building is surrounded with a verandah which is 4½ feet wide, and affords sufficient shelter from the sun's rays; never used for the accommodation of the sick, &c. Table of hospital accommodation. Total number of wards, 1. Total regulation number of beds, 50.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patients Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
1	50	113·5	18	12	24,516	490·3	17·2	2·5	7	5·5	3·5

The hospital is so placed as to receive the full benefit of the prevailing winds. The windows open on hinges like doors: their arrangement is conducive to ventilation.

6. The means of ventilation are the windows, doors, and two fireplaces. They are not sufficient to keep the wards free from odour or closeness.

7, 8. There are no means of cooling the air admitted into wards; the wards are warmed by means of two large fireplaces. The walls and ceilings are cleansed and limewashed every three or four months.

9. There is only one privy attached to the hospital, and it is connected with the building by a covered passage. It is merely a temporary mat-house which has just been erected. The cloacæ are carried away in earthen pots.

CHIRRAPOONJEE, KHASIA HILLS. BENGAL.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	10, 11. There are no lavatory arrangements, or means of bathing the sick, save by water carried to them by the hospital water-carrier. 12. There are no means for washing and drying the hospital linen. 13. With regard to the storage, the surgery where the medicines are kept is very damp, and a loss of them is thereby entailed. 14, 15. No replies to these queries. 16. There are no diet tables or forms for keeping the statistics of sickness, mortality, and invaliding at the station. 17 to 24. No replies to these queries.
XIII. BURIAL OF THE DEAD.	1. The burial ground used by British troops is half a mile distant to the leeward of the station. 2. Its area is about an acre, and the soil is gravelly and well drained. 3. There is no particular rule as to the space between graves, but their depth is about six feet. They are only opened a second time by special request; as when one or more of a family are buried in the same grave. Interment is compulsory within 48 hours after death at ordinary times, and as soon as possible after decease during epidemics. There are not spots set apart for natives; they generally burn their dead, but when buried they are taken out of the station to any spot the relations may choose, so as no inhabited or cultivated ground is adjacent. 4. The graveyard is never offensive. 5, 6, 7. The dead of camp followers or bazaar people are taken out of camp and burned or buried, according to creed. No injury to public health accrues from the present practice. No improvements to suggest.

(Signed) W. RICHARDSON,
Major, Commanding at Cherra.
THOMAS DILLON, M.D.,
Assistant Surgeon, in Medical Charge Sylhet Light Infantry, and Civil Station, Chirrapoonjee.

19th October 1860.

MURREE.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is very irregular and sub-alpine in aspect, in fact altogether mountainous. The hills around are for the most part well wooded with forest trees, such as oaks, horse-chesnuts, and the various genera of the natural order coniferæ, &c., on the higher hills, and acacias, euphorbias, olives, and Toon trees, &c., on the lower, whilst mountain springs are abundant everywhere. 2. The elevation of the station above the sea is about 7,800 ft., and about 2,500 ft. above the level of the adjacent country. The river Hanoo, a tributary of the river Indus, is about four miles to the west of the station, and a small mountain stream, a branch of the river Sohan, is about the same distance to the east of the station. The river Sohan empties itself into the river Jhelam; both are about from 1,500 to 2,000 feet below this station. There is no higher ground immediately adjoining the station, but there are numerous hills within a radius of 20 miles around, of various altitudes, from 2,000 feet above the elevation of Murree, to as many feet below it. The former are not adapted for sanitaria, owing to the rigour of the climate during the winter, but some of the latter are especially so from the mildness of the climate throughout the year. 3. About 24 miles south-east of Murree is the plateau of Kavor, about three miles long by two wide. Its surface is undulating and about 1,500 feet above the level of the plain. Springs are plentiful and there are two or three small rivulets on the borders of the plateau. At the north end of this plateau is the police station (a fort), and the village of Kavor, and near its centre are the ruins of an old Sikh cantonment. This plateau is well adapted for a hill cantonment, and is about 30 miles north-east from Rawul Pindi, and of easy access. About 30 miles south-west of Murree is the high hill of Nurpur, about 3,000 ft. above the plain, and 45 miles distant from Rawul Pindi. Its summit is somewhat flattened and wooded. Springs are the source of its water supply at the summit, and the river Hanoo flows at the northern base of the hill. Its site is well adapted for a convalescent depôt. On the summit are two holy shrines much resorted to by a certain sect of Mahommedans. 4. At Kavor water is obtained from numerous springs and the river Sohan flows about two miles north of the plateau. At Nurpur also springs are the source of water supply, and the river Hanoo flows along the northern base of the hill. There are neither marshes nor lakes in the vicinity of either site. The nearest water to Murree (besides the springs in the station) are the rivers Hanoo and Sohan, which flow respectively on the western and eastern bases of the hill, and about four miles from the summit; both are mountain streams. Neither vicinity is liable to overflow of water at any season. At Murree the surface is uneven, but there are no water-pits, and drainage is rapidly effected by the natural declivity of the site. 5. The upper portion of Murree is open and freely exposed to every wind. The lower part is sheltered from north-east and east winds and is somewhat encumbered by trees, but not sufficiently so materially to interfere with free external or internal ventilation, though after rains the trees hold the moisture for some time and render the neighbourhood damp. The temperature of the station is not raised by exposure to reflected sun heat, as the trees around absorb whatever heat there may be. During the winter and spring months north and north-east winds prevail, and their effect on health is invigorating. During the summer months west and north-west winds prevail, and bring with them dense fogs and rains. The effects of these are deleterious to the subjects of fevers of the intermittent type, especially to pulmonary affections and bowel complaints.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	6. The country surrounding the station is cultivated as well as the irregular surface of the ground will admit, chiefly with Indian corn and wheat, though a little of barley, rice, and cotton is also cultivated. There are no works of irrigation near the station. The cultivation of rice is prohibited within a distance of about a mile more or less of the station, at least such is nearly the average distance of the boundary line (within which all cultivation by the peasantry is prohibited) from the station. 7. The nearest city to the station is that of Rawul Pindi about 38 miles distant. 8. The mountain ridge on which Murree is situated consists of a hard grey sandstone, which at frequent and irregular intervals crops out from below a superimposed bed of indurated red clay, overlaid in most parts by a thin layer of black vegetable mould, replaced here and there by a heavy tenacious clay, the result of the disintegration of the red clay rocks. These characters belong to the main spur on which Murree is situated, as also to the numerous branches it gives off to the eastward. But on the west side the sandstone comes in contact with an extensive formation of nummulitic limestone, which constitutes the bulk of the Hazarah hills in that direction. The present site of Murree is new ground, and was never before occupied by any extensive population. 9. The depth at which water is found beneath the surface in the dry and rainy seasons is not known. There are no wells in the station, but surface springs are numerous. 10. The rain fall and water from surface springs are rapidly drained off, owing to the natural declivity of the hill sides. There is no higher ground, the drainage from which could pass into the subsoil of the station. 11. The water supply of the station is derived from numerous springs in various parts of cantonments and from two reservoirs within its limits. These latter are open stone built tanks, and contain an aggregate extent of about 2,500 feet tank surface. These tanks are at all times full more or less, and are known to contain frogs, water beetles, and a variety of confervæ; but there are no means of ascertaining the presence of other animals. No tank used for drinking purposes is also used for bathing. One tank, from its elevated and open position, is free from all chance of pollution by leaves and other matter falling into it, or from the drainage of surface impurities; but the other, situated low down the hill, is open to pollution from both these causes. No nuisance or malaria proceeds from these tanks, nor from the small ponds scattered over the station, and of which one is to be found in the grounds around almost every house. 12. The amount of water supply available for the station is not known. The qualities of the water are inferior, the colour is cloudy and sometimes muddy, the taste and smell are also; but especially after rain more or less earthy. These objectionable qualities are, however, easily removed by filtering, a process very generally practised at this station. It is sometimes necessary to boil the water, and then filter it in order to quite get rid of the peculiar taste acquired by the water during its percolation through and over the clay and vegetable mould covering the surface. These remarks apply especially to the water of those springs that issue on the surface in forest lands or well wooded spots. There are no means of ascertaining the chemical composition and microscopic characters of the water; but it is soft, its amount is sufficient, and when filtered is I believe of good quality and not injurious to health, but I have not had enough experience of this point. By the natives (principally occasional visitors) the water is considered to possess inferior qualities and is said to cause colic. The method in general practice, viz., boiling and filtering through layers of sand and charcoal, is I believe sufficient to deprive the water of the impurities it contains, and render it wholesome and fit for use. 13. During the rainy season, viz., from June 15th to September 15th, the station is more or less damp, owing to the trees and vegetation holding the moisture to a considerable extent, and on this account is prejudicial to the welfare of fever cases, more especially of the intermittent form, and bowel complaints and affections of the liver. The winter is too rigorous for cases of pulmonary disease. 14. No reply to this query.
II. Climate.	1. Hitherto the only instrument for conducting meteorological observations at the civil dispensary has been a thermometer; but within the last month a rain gauge has also been supplied. 2. There are no data available at this station from which to prepare a table of meteorological observations. [Note.—No information respecting this station is given other than that contained in the foregoing replies.]

(No date.)

(Signed) H. W. Bellew, Assistant Surgeon,
In Civil Medical Charge, Murree.

JUBBULPORE.

Accommodation—Queen's Troops { Artillery 105 / Infantry 722 }

Accommodation—Native Troops { Artillery - 14 Gun Lascars. / Cavalry - 160 / Infantry - 385 }

References to Subjects and Queries.	Replies.
I. Topography.	1. The aspect of the country surrounding the station is hilly to the south-east and west and flat to the north. There is no wood, but plenty of jungle and water in the vicinity. 2. The station has an elevation of 1,250 feet above the level of the sea, and a moderate one above the adjacent country of from 5 to 20 feet, while the site of the European barracks is 20 feet above the ordinary level of the station. There is no higher or healthier ground adjoining Jubbulpore. 3. The nearest table land is distant from the station about 10 miles on the Mundlah road, and is 350 feet above the station.

JUBBULPORE. BENGAL.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	4. The waters nearest to the station are the Nerbudda river distant four miles and a half, the Oomtee nullah distant from three quarters to one mile, and a nullah without name about 400 yards from the European barracks. Tanks are very numerous, and there is a large swamp about 600 yards to the east of the barracks. I cannot say whether or not the vicinity is liable to overflow, not having been at this station during the rains. There are plenty of ravines and broken ground in the vicinity of the station, and their effect on health is very bad. 5. The station is shut in on the western, northern and eastern sides by rocky ridges and hills. The temperature is raised by the buildings being exposed to reflected sun heat, and by the numerous rocky hills, particularly the ridge of rock 1,000 yards to the westward. The station is not exposed to cold or variable winds, and the climate is very equable. 6. The country surrounding the station is cultivated in parts. There are no works of irrigation, nor any artificial irrigation near the station beyond damming up bunds of fields. Rice is cultivated in the surrounding villages, some of which border on the cantonment; but indigo is not grown, nor the preparation of hemp or flax carried on near. 7. The native town of Jubbulpore is two miles distant from cantonments. 8. The general surface soils of the station are sand and black cotton soil, with boulders of rock (almost hills), cropping up here and there through them of black trap sandstone, or of the gravel disintegrated laterite. 9. Water is usually found in the station at from 6 to 50 feet, in the barracks at from 12 to 60 feet; but in the lower parts of the station it rises to within 6 feet of the surface. 10. The rainfall or water from surface springs generally flows readily away to the numerous small nullahs, and there is no drainage from adjacent higher ground flowing into the subsoil of the station. 11. The water supply of the station is derived from wells. The tanks are nearly dry in the hot season, some quite so. They contain duck-weed and other aquatic plants of rapid growth, and fish of various kinds. No tank is used for drinking purposes by the Europeans of the station. The wells are generally clear of trees, and cannot therefore be polluted by dead leaves falling into them. Nuisance and malaria proceed from the tanks, and the only way to remove them is to drain the tanks and fill them in, which in many instances could be easily done. 12. The water supply of the station is abundant, clear, and well tasted, and in some wells impregnated with iron. It is alkaline and soft, and no impurities can be detected by the microscope. The water is raised from the wells in accordance with the custom of the country, viz., by bheesties or water carriers in a leather musak. 13. There is a high range of rocky hills one mile to the westward of the station, and which greatly increases the heat. 14. Sites for barracks are generally selected by a committee composed of the officer commanding the station, the magistrate, the officer commanding the regiment or battery, and two medical officers.
II. CLIMATE.	1. A thermometer is the only instrument at the station for conducting and registering meteorological observations, and is kept in the hospital. 2. No reply to this query. 3. The committee having been here only 3 months cannot of their own knowledge give any information respecting the dryness or moisture, heat or cold, variability, &c. of the climate, nor its effect on the health of the troops, nor which are the most healthy or unhealthy months here. 4. In the district of Sohagpore is a plateau called "Ummurkuntuk," 6 miles long by 5 broad, at an elevation above the sea of 3,600 feet, and distant from Jubbulpore viâ Shaipoorah 130 miles. This plateau is strongly recommended as a sanitarium for European soldiers. 5. No reply to this question.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Ground plans of the station, &c., and plan of the barracks, showing their construction, are forwarded. 4. Table of barrack accommodation. Date of construction. February 1858 commenced. Total number of rooms or huts. 10 ranges. Each has 3 compartments. Four rooms for non-commissioned officers.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		Feet.	Feet.	Feet.				Inches.			
1 range	100 × 10 = 1,000	303½	20	17	103,190 × 10 = 1,031,900	1,000	60	15	There are no windows, as doors with ventilators are used instead.		
Outer compartment	—	97½	20	17	—	—	—	—			
Centre compartment	—	108½	20	17	—	—	—	—			
Non-commissioned officers' rooms	—	26	10	12½	—	—	—	—			
Guard room	27	96½	18	16	27,792	1,000	60	—			
10 prison cells	10	86½	7	17	10,293	1,000	60	—			

5. There are verandahs on both sides of the barracks, extending the whole length. These are occupied for sleeping when the men are very much crowded in the rooms, which has been the case ever since March 1860. There are no windows, jalousies, or jhilmils.
6. Wooden cots with string bottoms are used in the barracks for the soldiers to sleep in.
7. The tents used are made of thick country cloth; double poled (bamboos); 13 feet high; side walls 5 feet; dimensions 21 by 15 feet. There are 16 men in each tent, and the space per man is 177 cubic feet and 19 feet superficial area. The tents are all of the same size and pattern.
8. The barracks, huts, &c. are ventilated by a portion of the ridge of each building being left open, then covered and overlapped by another small roof as per sketch transmitted. The ventilation is not sufficient (with 100 men in the barracks). To keep the air cool, the door-

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	ways on the western side are covered by wet tatties, through which the wind freely blows. These tatties are frames of bamboo-work, the size of the doors, covered with the "Kus" grass; the cost is about 6 rupees each. 9. The barracks are constructed of burnt bricks in lime; flagged stone floors; sawn wood couples for the roof, which is thatched with grass 9 inches thick. The doors are battened on one side, and partly glazed on the other. The tents are made of Dosootee cloth, cotton ropes, and bamboo poles; the inner fly is lined with blue cloth, 2½ feet below the upper. The huts for native troops are of mud walls with tiled roofs. 10. The floors are of well rammed moorum and broken stones, covered with mica schist slabs set in lime. Half of the barrack floors are raised 18 inches above the level of the ground, but the remainder only 9 inches. 11. The barracks are capable of very great improvement. Repairs are executed by the Executive Engineer and Barrack Department, but they are not performed in particularly quick time. The senior medical officer and the officer commanding are responsible for the general sanitary state of the cantonment. The walls and ceilings of the barracks are cleansed and limewashed annually. 12. The wash-houses are buildings 20 feet by 15 feet, 8½ feet high, with kutcha pucka walls and thatched roof. Tubs or half casks are supplied for the use of the men. The interior is drained into a drain running round the building, which leads again into a catch drain. The buildings are 10 in number. A plunge bath is being constructed, 60 feet by 15 feet, with a depth of 5½ feet, enclosed with lattice work openings and tiled roof. 13. The barrack cook rooms are double and single kutcha pucka walls, pointed roof, tiled, and the floors of moorum. The dimensions of the double cook room are, 144 feet by 12 feet, height, 8 feet. Drains conduct from the interior of the surface of the ground around all the refuse water, pure water being supplied by the bheesties. 14. The privies are constructed partly of pucka, partly of kutcha pucka. They are single and double buildings; the former 20 feet by 14 feet, height 8 feet, and the latter 40 feet by 14 feet, with screen walls in front of the door and in the rear. They are drained from the inside into a cesspool, the contents of which are removed by the sweepers to a distance every morning. 15. These buildings are unventilated except by the doorways. The barracks are lighted at night by oil lamps, six to each barrack. 16. For drainage and sewerage of barracks, there is simply a surface arrangement of open drains, which, as the barracks stand on a slope, conduct the water to a nullah running along the western side about 30 yards from the lower ranges. There are no sewers, but the above means are sufficient for carrying away all the surface water and drainage from the men's lavatories, cook-houses, privies, urinals, &c. No part of either barracks or hospital can be said to be damp. The cesspits are about 20 yards from the nearest men's quarters, and about 100 yards from the hospital. Mahters or sweepers carry away the refuse to a distance three times a day. There are many foul ditches both in and outside the station. 17. The surface cleansing of the cantonment and its vicinity is performed by sweepers, but is not efficiently done. The refuse is removed to a distance, and burned if possible. 18. The surface of the cantonment is not kept free of vegetation, and the bazaar is very badly ventilated and requires opening out. 19. The drainage of the bazaar is insufficient, and the ventilation bad. The water supply is good, but cleanliness is almost impossible with no latrines and every hut crowded. The greatest improvements might and will be effected when funds become available. The native houses near the station are ruinous mud huts with tiled roofs. No native will keep his drains nor the precincts of his house clean unless obliged. No nuisance is experienced in barracks from wind blowing over the native dwellings, but a great one is felt from the tanks, which generally dry up in the hot weather. This, however, could be put a stop to by filling them in. 20. Animals for the use of the troops are slaughtered at a distance of half a mile from the station, and nuisance is experienced only when the place is to windward. 21. Bazaar horses, and those of camp followers, are picketed in rear of the barracks, and the manure is regularly removed and burned. 22. The picketing ground for the artillery horses is to the westward of the barracks, and about 200 yards distant, that for the cavalry horses half a mile distant to the north-west. There are no stables. The manure is burned. 23. There are at present sufficient quarters for married non-commissioned officers and men at this station: the married people do not occupy barrack-rooms with the men.
Officers' Quarters.	1. Officers' quarters at this station are the usual Indian bungalows. I would recommend as an improvement that they be placed nearer to their men's barracks.
IV. Health of the Troops.	1. As far as the experience of the committee extends, the station and the district in which it is situated are healthy. 2. The diseases most prevalent among the native population are fevers of the intermittent type, spleen disease, bowel complaints, and rapid chest affections. Epidemics are rare. 3. Attribute the unhealthiness of the neighbouring native population to the sudden and frequent changes of temperature, the numberless tanks, and large tracts of jungle. 4. The infantry arrived here from Banda, and the artillery from Umballa. The 2nd troop 3rd brigade H.M.'s Bombay horse artillery arrived at Umballa March 3rd 1859, and remained there till December 24 same year, when the troops were marched to Jubbulpore, and arrived in cantonments on March 16th, 1860. The troop was very healthy at Umballa, the mortality per annum being 20 per 1,000. Venereal diseases and fevers were the most prevalent. The troop was in good health on its arrival in Jubbulpore, and has continued so. It has had no casualties here. Venereal diseases very prevalent, and just now fevers of a mild type. H.M.'s 97th regiment arrived at Banda on the 26th January 1859, and left that station on the 10th February 1860. The five companies stationed there during that period were very unhealthy, and suffered chiefly from fevers, diseases of the bowels and stomach, diseases of the brain and venereal. The regiment arrived at Jubbulpore on the 5th March 1860 in a good state of health, and since its arrival has chiefly suffered from fever, venereal, and bowel complaints. No portion of the men's present accommodation is more unhealthy than the rest.

JUBBULPORE. BENGAL.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	5. The troops at this station are never camped out. 6. I was quartered with H.M.'s 53rd regiment at the hill station of Dugshai (one of the Simla group of sanitaria), elevation 6,000 feet, for a period of 18 months. During the first season the mortality was large, and more than half of it was caused by hill diarrhœa. The regiment had been stationed during the two previous years at Peshawur, and the health of nearly every man was impaired by repeated attacks of severe intermittent fever, endemic to that station. It was remarked that the worst cases of hill diarrhœa occurred amongst those men who had suffered most from the fever of Peshawur. The same remarks apply to H.M.'s 32nd regiment, which was removed from Peshawur simultaneously with the 53rd, and occupied the neighbouring hill station of Kussowlie, 9 miles distant from Dugshai. The excessive cold during the winter at Dugshai hastened the fatal issue of a number of the cases under treatment for hill diarrhœa, but the health of the men greatly improved during the second year of residence, and on leaving the station for the plains in October 1855, the whole regiment was in a high state of health and efficiency. There can be no doubt that the sudden change from Peshawur to the hills in a great measure caused the sickness and mortality above noticed, and that a year's intermediate residence in some healthy station in the plains, such as Rawul Pindee, Sealkote, Jullunder, or Ferozepore, would be a more judicious arrangement than a direct move from Peshawur to the hills. I was subsequently (in 1857) in medical charge of the convalescent depôt of Darjeeling in Bengal (elevation 8,000 feet), and my experience leads me to regard it as much better adapted for convalescents than any other sanitarium in the Bengal presidency,—a pre-eminence doubtless attributable to the equableness of the climate. The mean thermometric range is less at Darjeeling than at any of the hill stations in the North-west provinces, and the bane of the latter, viz., the wasting and almost unmanageable diarrhœa, is unknown at the former. 7. I have not observed that troops are more liable to febrile and other diseases on removing from the hills to the plains. There is no reason why they should be so, provided they are removed at the proper time of the year, namely, after the cold weather has well set in. 8. From my experience, I approve of selecting hill stations for troops. 9. The hill diarrhœa before noticed is the only disease to which troops are liable to be attacked on proceeding to the hills. 10. As regards the precautions required as to diet, clothing, shelter, &c., I did not observe any errors, in the hill stations with which I am acquainted, that would be likely to increase a tendency to endemic disease. 11. The spring and autumn months are those best adapted for a residence in the hills, and convalescents cannot be expected to derive permanent benefit from a residence in a hill station under a shorter period than two seasons. 12. I am not aware that there is any period of residence in the hills beyond which injury is likely to be inflicted on the health of troops on returning to service in the plains. 13. The chief precaution necessary to be observed on removing men from the hills to service in the plains is to shift them at the proper time, viz., after the cold season has well set in. 14. There can be no doubt that if all the European troops in India could always be located in well-chosen hill stations, sickness and mortality would fall to a much lower average. It is, therefore, obvious that service in the plains, with short periods of change to the hills, cannot be equally conducive to the preservation of health and the prevention of mortality. A prolonged residence in an unhealthy station in the plains exercises a pernicious effect on both the health and spirits of the troops and convalescents; but no desirable object can be gained by moving troops frequently from stations which are found to be healthy. 15. At the hill station of Dugshai the barracks for the companies are very good in every respect; but the barracks for married soldiers are not good; they are not sufficiently commodious, and they have not proper means of ventilation. The hospital at the same station is very defective, both as to lighting and ventilation. At the sanitarium of Darjeeling both the barracks and hospital were faulty in construction. The lighting and ventilation also were defective, and the flooring, ceiling, and walls unmistakably showed that the works had been hurriedly and carelessly executed. 16. The two hill stations with which I am acquainted, viz., Dugshai and Darjeeling, have elevations of 6,000 and 8,000 feet above the level of the sea, and it has been shown that Dugshai has not proved so healthy as might have been expected, but that Dargeeling has been found to be eminently healthy, and that its salubrity is, doubtless, owing to the equableness of its climate. It is, therefore, extremely probable, though I have no personal experience in support of the statement, that a medium elevation of 4,000 or 4,500 feet in the north-west sanitaria would be found more conducive to the health of convalescents than a higher range of elevation. The extreme cold of higher elevations would be avoided, a more equable temperature secured, and probably, also, a drier climate. A climate involving a wide thermometric range is inimical to convalescents who have lost their health in the plains. Though Darjeeling stands as high, if not higher, than the north-west sanitaria, it approaches nearer to the tropics, and hence its milder climate. 17. I am not sufficiently acquainted with the district surrounding this station to enable me to say if there is any higher or healthier ground near, which could be advantageously occupied as a hill station. 18. There can be no doubt that a light sandy soil, which does not retain moisture on the surface, is the most healthy. 19. Soldiers should not be sent to India before the age of 22, and the best period at which they can land there is in the cold season, not before the beginning of November. Troops on first landing in India, if they are destined for the North-west provinces, are detained at one of the depôts near Calcutta until they have been supplied with clothing and other necessaries. They are despatched to their destinations as far as Cawnpore by bullock-train, railway, or river steamer, and beyond Cawnpore by bullock-train or regular marches. Drill is never carried on to any extent, except during the cold season, and the duties in most stations are usually light. For preserving the health of recruits on first landing in India, I would recommend sufficient and properly ventilated barrack accommodation, suitable clothing, cleanliness, athletic games, and other amusements; an avoidance of the native bazaars, and sobriety. 20. Young recruits, growing lads of weakly constitutions would undoubtedly benefit by a residence in the hills before serving in the plains.

References to Subjects and Queries.	Replies.
IV. Health of the Troops—*cont.*	21. The mode of transport of troops by land is by railway, bullock-train, and marching; that by water in troop-boats, towed by steamers. Troops usually suffer less when transported by land, from the fact that the men are sometimes overcrowded. 22. A British soldier should not serve in India more than 10 years. 23. The mode of conducting medical boards, both at the station and the presidencies, appears to me to be good. 24. Invalids should not leave India, when destined for home, later than the end of March.
Diseases.	1. Health inspection parades take place at this station once a week, usually on Saturday mornings. 2. There are not, nor have there been, any cases of scorbutus or scorbutic disease among the troops at this station. 3. The proportion of hepatic disease at this station has not hitherto amounted to 2 per cent. It not unfrequently accompanies or follows bowel complaints, and its most frequent exciting causes are intemperance, excessive heat, overcrowding, and defective ventilation. 4. Dracunculus is of very rare occurrence at this station, and no case of it has occurred amongst the European troops. 5. The proportion which the constantly sick in hospital from venereal disease bears to the total sick in hospital from all other diseases is about 34 per cent. When barracks are situated in the vicinity of large bazaars and populous native cities, it is almost impossible to guard against a large proportion of venereal disease. Lock hospitals would be decidedly advantageous, in fact the only effectual means of diminishing the liability of soldiers to these diseases. NOTE.—One half of the admissions into hospital are from venereal diseases; and as every bazaar swarms with native prostitutes, always more or less suffering from disease, I am of opinion these people should be brought under some health regulations, with a view of lessening the number of soldiers who are rendered unfit for service by them. W. W. TURNER, Colonel, Commanding the station.
	6. The following are the diseases from which the troops at this station suffer, viz.:—Ephemeral and intermittent fevers, with many cases of rheumatism. They do not suffer much from dysentery, and no case of cholera or small pox has occurred here. The following Table shows the proportion which admissions and deaths from these diseases bear to the total admissions and deaths:—

Diseases.	Proportion of Admissions to other Diseases.	Proportion of Deaths to Admissions.
Fevers -	1 in $6\frac{6}{8}$	None.
Dysentery -	1 in $38\frac{5}{7}$	1 in $3\frac{1}{2}$
Cholera -	None.	None.
Small Pox -	Do.	Do.
Rheumatism	1 in $13\frac{11}{26}$	Do.

	7. The more frequent zymotic diseases are miasmatic and enthetic. They are most prevalent during the rainy season, and after its close. In the rainy season variations of temperature are frequent, and the atmosphere is laden with moisture, and after its close a high temperature acting on decaying vegetation generates malaria. The bazaar is in a very bad sanitary condition, the drainage and ventilation are defective, and the dwellings overcrowded. The strictest personal cleanliness is insisted on as far as regards the troops, but the habits of the natives have been and ever will be the reverse. 8. Neither the duties at this station nor habits on the march predispose to epidemic disease. 9. The troops at present quartered at this station have not as yet passed through a malarial season. I am not aware that small doses of quinine have been previously tried as a prophylactic. 10. I have not resided at this station sufficiently long to enable me to judge of its epidemics, and these have hitherto been of rare occurrence.
V. INTEMPERANCE.	1. British soldiers as a rule are intemperate, but there are only a few confirmed drunkards amongst them, 1 in about every 200. 2. The total admissions into hospital from intemperance only amount to 7, and indirectly two or three. The following Table shows the effect of total abstinence, temperance, and drunkenness on the amount of sickness and mortality at the station:—

Classes.	Strength.	Total Admissions.	Total Deaths.	Per-centage of Admissions to Strength.	Per-centage of Deaths to Strength.	Per-centage of Deaths to Admissions.
Teetotallers -	26	5	None.	$19\frac{5}{13}$	None.	None.
Temperate -	601	198	2	$32\frac{5}{7}\frac{6}{0}\frac{8}{1}$	$\frac{2}{6}\frac{}{0}\frac{}{1}$	$1\frac{1}{9}\frac{}{9}$
Intemperate -	97	7	None.	$7\frac{2}{9}\frac{1}{7}$	None.	None.

	Drunkenness is always punished as an offence. 3. Distilled spirits are sold in the canteen, and illegally in the bazaar; the quality is very bad. Some men take one dram, others two a day. Spirit does not form part of the soldiers' ration, either at the station, on the march, or in the field. Old soldiers often take a dram before morning parade, but its effect must be injurious to health. *It is never given as a ration to convalescents.* No drinks are sold in the canteen except beer and spirits. Various kinds of sherbet are sold in the bazaar, which are almost all unwholesome, more especially when allowed to stand long enough to permit of fermentation commencing.

JUBBULPORE. BENGAL.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	4. The consumption of spirits by troops and convalescents is injurious to health, and is not conducive to the efficiency or internal discipline of the corps. 5. The abolition of spirituous liquors as part of the ration, would be highly beneficial to the health of troops. 6. Sound malt liquor or wine would be decidedly more beneficial to the health of troops than spirituous drinks. 7. Coffee and ginger beer are largely used here; but lemonade and soda water are luxuries too expensive. There can be no doubt that a cup of good hot coffee is the most wholesome stimulant of which a soldier can partake. 8. The entire suppression of the spirit ration would undoubtedly increase the health and efficiency of the troops. 9. It would be beneficial to prohibit the sale of spirituous liquors in the canteens, and permit only beer, coffee, tea, lemonade, &c., to be sold to the troops. 10, 11. No replies to these queries.
VI Diet.	1. The ration for Queen's British troops and European troops in the Indian army is the same, and composed as follows, viz.:—1 lb. of meat (mutton or beef), 1 lb. bread, 1 lb. vegetables, $\frac{5}{7}$ oz. tea or $1\frac{5}{7}$ oz. coffee, $2\frac{1}{2}$ oz. sugar, 1 oz. salt, 4 oz. rice, and 3 lbs. firewood. There is a responsible inspection of the constituents of the ration, by the orderly officer of the day, and after by the commanding officer and surgeon. 2. A due proportion of vegetables enters into the composition of the ration. There is no stoppage. The men here have three meals a day, viz.—breakfast at 8 a.m., dinner at 1 p.m. and tea at half-past 5 p.m. 3. The rations are generally composed of the best meat and vegetables procurable, but the cooking is, as a general rule, not sufficiently varied. The meat is almost invariably fried, and soup or broth is seldom made from it. No part of the ration is disposed of. 4. The cookhouses and cooking apparatus have been described. Tea and coffee are properly prepared for the troops, and the men generally have one or the other before a march. 5. Gardens for the cultivation of vegetables by soldiers at this station could be advantageously established, under local regulations by the commanding officer.
VII. Dress, Accoutrements, and Duties.	1. The soldiers dress at this station consists of cane helmets, khakee coat and trousers, cotton shirt, flannel cholera belt, woollen socks, and boots. They are also provided with ammunition pouch and bayonet, with white leather belts, and cap pouch. I consider the dress as suitable to the climate, and for the soldier's duties by day and night. The dress at present in use, loose khakee tunics and trousers, and the wicker helmet, are well adapted for the hot season in the plains, and the loose undress scarlet jacket recently issued, instead of the shell jacket is sufficiently warm clothing for the cold season, but the thick black cloth trousers, then issued for wear are not suited to the climate of India. Trousers of stout double-milled flannel or thick serge would be infinitely more comfortable. Flannel shirts and socks should also be used in India, more especially during the rainy and cold seasons. The guard dress is cloth or cotton according to the season, and there are wooden sentry boxes to protect the men from rain and heat.
Duties.	1. Inasmuch as men thoroughly drilled at home would be less subjected to the fatigue of constant drill on joining their regiments in India, such a practice would decidedly be beneficial to health. 2. A soldier's duties at this station consist of guards, pickets, fatigues, and regimental drills, none of which extend over an hour's duration, from 5 or 6 a.m. They are very conducive to health. The best time for drills, parades, or marches (respecting which there are regimental orders), is between 5 and 9 a.m. The men have every night in bed during the week on an average; and are on duty about one day in 20. 3. Guards are mounted about three quarters of a mile from the barracks, and last all day and night. There are always roll calls, but their number and time vary. Night duty is generally considered injurious.
VIII. Instruction and Recreation.	1. The following are the only means of recreation and instruction available at this station, viz.:—one skittle ground, one regimental school, regimental library and reading room, one armourers' workshop, and one theatre. These means are not sufficient to keep the men occupied during the wet season and heat of the day. In the hot and rainy seasons, soldiers are not allowed to leave barracks after 8 a.m., or before 5 p.m. 2. As an improvement I would suggest that ball courts, gymnasia, and carpenters' and shoemakers' shops be built for the men. 3. There are military savings banks at this station. 4. There is not sufficient shade from trees, sheds, verandahs, &c., to enable the men to take exercise without injury to health during the day.
IX. Military Prisons.	1. The military prisons at this station are as yet unfinished.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2, 3. Suggestions or recommendations by the medical officer respecting the conduct of the line of march, bivouacking, camping, &c., are invariably carried out, circumstances permitting. 4. Field hospitals are established when such a step becomes necessary in consequence of the increased number of sick and maimed during war. Diets, servants, clothing, bedding, and doolies for the conveyance of the sick, are provided by the commissariat; medicines and instruments from the nearest depôt. A special field-surgeon and assistants are appointed for duty in the field-hospitals, and an officer or agent of the commissariat is attached for the purpose of procuring and maintaining the necessary supplies.
XI. Statistics of Sickness and Mortality.	N.B.—Jubbulpore is considered a healthy station. It has been a station for European troops for two hot seasons, 1858–59. They belonged to the Madras field division. There are no records of sickness and mortality to refer to.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1, 2. The hospital is situated about 400 yards in the rear, and to the left of the left wing of the barracks. There are no stables in the vicinity of the hospital, while the bazaar is distant upwards of half a mile to the north-west, and the houses of the civil population generally are at a still greater distance. The site is open and freely ventilated, and there are no buildings, high walls, or trees, which interfere with the ventilation. The site generally appears to be good as regards elevation, drainage, &c.; but the hospital is not as yet completed, and has not been occupied by sick. 3. The water supply of the hospital is abundant and wholesome. 4. All refuse water is removed by means of an open pucca drain. 5. There are no wards, except those on the ground floor, which are raised on a solid plinth of masonry about two feet above the level of the ground. There is, therefore, no perflation of air whatever beneath the floors. No provision is made for conveying away the roof and rain water. The hospital is built of bricks and lime; the roof and walls are single, and the latter are of sufficient thickness to keep the hospital cool; but the roof is composed of tiles, which do not keep out the heat as well as thatch. There is an enclosed verandah on each side, 10 feet in breadth, and an outer open verandah on each side of same width, affording sufficient shelter from the rays of the sun. The hospital consists of one flat.

Table of Hospital Accommodation.

Total number of wards - - - 3
Total regulation number of beds - - 60

Wards or Hospital Huts.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
1 ward divided into 3 compartments by open archways.	20 sick in each compartment.	74 feet each.	22 feet.	22 feet.	35,360	1,768	- - -	2 feet.	There are no windows. The doors, 15 on each side, are half-glazed—a glazed ventilator being placed in every door.		

The hospital faces the west, and receives the full benefit of the prevailing winds. There are no windows in the building, but the doors are provided with a ventilator, turning on a pivot.

6. Ventilation is effected by the doors and the ventilators above them, as also by apertures near the top of the wall on each side, communicating with the roof verandah. Apertures also exist in the roof, one for each ward or compartment. These means of ventilation appear to be sufficient to keep the wards free from odour and closeness. There are no jalousies or jhilmils.
7. Tatties are used for cooling the air in the wards. They are made of a frame of bamboo, covered with layers of "khus-khus" grass, and are kept constantly wetted, by which means the hot winds in passing through them are cooled.
8. There are no artificial means of warming the wards. The walls and ceilings of the hospital are cleansed and limewashed by regulation twice a year.
9. The hospital privy is situated a few paces behind the north-east corner of the hospital, and is connected with it by a covered passage. It is well constructed and ventilated, but has no urinals connected with it. Water is supplied by bheesties. There is an open cess-pit behind, but the ordure, &c. is carried away in filth-carts and deposited at a distance. The privy has not as yet been used.
10. There are four rooms apportioned for lavatories, which are situated at the ends of the enclosed verandah, and will be amply sufficient for the purpose.
11. The bath-room is enclosed under the same room as the privy, but is separated from it by a thick wall. It is sufficient for the purpose, and very convenient.
12. The washing and drying of hospital linen is invariably performed by native washermen in the open air.
13. The store-room at present is unfinished.
14. The bedsteads are wooden frames with twine interlaced, and tightly stretched to the sides and ends. The bedding consists of one mattrass, one bolster, two pillows, two sheets, two blankets, and one quilt. Iron frameworks, with sacking bottoms, would be more suitable than wood as being less liable to harbour insects and vermin.
15. The hospital kitchen is situated a few paces in the rear of, and opposite the centre of the hospital. The diets are cooked in copper vessels, which are tinned twice a month. They are sufficient for the purpose required, and the diets are well-cooked, being varied *ad libitum*.
16. Copies of the diet tables, &c., are transmitted.
17. The provision for attendance in hospital is one hospital serjeant, and two orderlies allowed by the commanding officer, who never objects to the employment of as many orderlies as may be deemed necessary.
18. As already stated, the hospital is not completed, and has not been occupied.
19. The deficiencies with regard to the building are, a dead-house, want of accommodation for sick women and children, and quarters for medical subordinates, but there do not appear to be any deficiencies with regard to the sanitary condition of the hospital.
20. The only places of exercise for convalescents are the verandahs of the hospital.
21. There is no arrangement or provision for soldiers' sick wives or children, who can only at present be treated in their barrack rooms,—a most unsatisfactory arrangement.
22. No special local hospital regulations exist.
23. Change of diets and medical comforts within the hospital, at stations, camp, and on the march are entirely under the control of the medical officer, whose recommendations on sanitary matters are invariably promptly attended to.
24. There are no wards for convalescents at this station, but such accommodation would undoubtedly be advantageous.

XIII. Burial of the Dead.	1, 2. The burial ground for the use of the troops is in the station, and to the west of the Sudder bazaar. Its area is 28,700 square feet; the soil and subsoil being sand and loam.

References to Subjects and Queries.	REPLIES.
XIII. Burial of the Dead —*cont.*	3. The graves are 6 feet by 3 feet, and 5 feet deep, with an interval between each of from 2 to 3 feet. They are never re-opened. Interment takes place at all times as soon as the coffins can be made ready. The Mussulman troops are buried without the cantonments; the Hindoos being burnt at a distance from the station by their friends. 4. The graveyard has not as yet proved offensive. The men are buried, as soon as coffins can be got ready, in the presence of the officer commanding, &c. of the companies to which they belonged, the usual military honours being given. 5, 6, 7. The dead of camp followers and bazaar people are disposed of according to caste, in the same manner as the dead of native troops. No injury accrues to the health of the public from the present mode of disposal of the dead, and no improvement on this head can be suggested.

(Signed) W. W. TURNER, Lieut.-Colonel,
H.M.'s 97th Regiment, Commanding Station.
A. MACRAE, M.D.,
Surgeon, 97th Regiment.
FREDERICK A. HOWES, Lieutenant,
Officiating Executive Engineer, Jub. Dn. P. W.

Dated 10th July 1860.

NOTE.—All the members of the committee labour under the disadvantage of having had only four months' experience of the station.

APPENDIX.

EXTRACT of a letter No. 3,985, dated 17th August 1860, addressed by the Quartermaster-General of the Army, Bengal Presidency, to the officer commanding Saugor district, having reference to questions not properly answered on the sanitary state of the Indian Army for the station of Jubbulpore.

Question 4.—TOPOGRAPHY.—Cannot the prejudicial effect of the ravines and broken ground be remedied or improved?—*Further answer vide annexments.*

Question 6.—TOPOGRAPHY.—The local civil officers should be asked for the information which the committee express themselves unable to afford.—*Further answer vide annexments.*

Clause 7, *Question* 11.—TOPOGRAPHY.—A special report should be made on the tanks complained of, and it should be shown how they could be drained and filled in, and at what cost.—*Further answer vide annexments.*

Question 4.—CLIMATE.—Has any examination of the "Ummerkuntuk" sanitarium ever been made? If so, I will be glad to receive the report accompanied by statistical and meteorological observations for submission to the Commander-in-Chief and Government.—*Further answer vide annexments.*

Question 5, *Clause* 3.—SANITARY CONDITION OF STATION.—A more detailed return, showing how each of the barracks is occupied by the infantry and artillery, is required, as the former has a detachment absent, and it should be explained why, if the men are so crowded as to necessitate their sleeping in the verandahs, the want of barrack room has not before been brought to notice, and specially reported upon.—*Further answer vide annexments.*

Question 14.—SANITARY CONDITION OF STATION.—Could not the privies be cleaned twice a day, morning and evening?—*Further answer vide annexments.*

Question 16, *last Clause.*—SANITARY CONDITION OF STATION.—Have any measures ever been taken or applied for to remove the nuisance of the foul ditches? If not, it should be explained why the subject has been overlooked. A station order temporarily entertaining the necessary establishment for this purpose would have been sanctioned had it been attached to a representation of its urgency. A further report on this and the efficient cleansing of the station with reference to queries 17 and 18 should be submitted.

The replies to the above and following questions regarding conservancy evince a want of local arrangement and control, and the matter must be attended to, and specially reported on, if aid is required from Government, but it should be shown that this is absolutely necessary,—why bazaar establishments and local funds have not been raised, and whether the civil authorities have been applied to for prison labour and other assistance to effect these improvements.—*Further answer vide annexments.*

Question 4.—HEALTH OF THE TROOPS.—The answer to query 4 is incomplete.—*Further answer vide annexments.*

Question 1.—INSTRUCTION AND RECREATION.—Why has only 1 skittle alley been supplied, 2 per regiment being authorized? The commanding officer should refer to the executive engineer for the proper number for both infantry and artillery.—*Further answer vide annexments.*

(True extract.)
F. W. ROBERTS, Major,
D. A. Quartermaster-General of the Army.

ANSWERS to the Queries contained in No. 3,985, dated Quartermaster-General's Office, Simla, the 17th August 1860.

Query 4.—Cannot the prejudicial effect of the ravines and broken ground be remedied or improved?

Answer.—Yes, it might be improved to a certain extent by draining and filling in, but the expense would be considerable.

Query 6.—The local civil officers should be asked for the information which the committee express themselves unable to afford?

Answer.—The information has now been supplied by the deputy commissioner, and is attached to the folio.

Clause 7, *Query* 11.—A special report should be made on the tanks complained of, and it should be shown how they could be drained or filled in, and at what cost?

Answer.—Some of the tanks complained of are in the civil station. Of the two, worst in the military cantonments. estimates of the probable cost of draining and filling them in are attached and marked C.

Query 4.—Has any examination of the "Ummerkuntuk" sanitarium ever been made? If so, I will be glad to receive the report, accompanied by statistical and meteorological observations, for submission to the commander-in-chief and Government?

Answer.—A special examination has been made by Capt. Pearson. A copy of the report shall be sent as soon as obtained from the commissioner.

Clause 3, *Query* 5.—A more detailed return, showing how each of the barracks is occupied by the infantry and artillery, is required, as the former has a detachment absent; and it should be explained why, if the men are so crowded as to necessitate their sleeping in the verandahs, the want of barrack room has not before been brought to notice and specially reported upon?

Answer.—*Vide* return D., attached.

The want of accommodation was reported, *vide* letter E., attached.

Query 14.—Could not the privies be cleaned twice a day, morning and evening?

Answer.—The privies are regularly cleaned twice a day.

Query 16, *last Clause.*—Have any measures ever been adopted or applied for to remove the nuisance of the foul ditches; if not, it should be explained why the subject has been overlooked. A station order, temporarily entertaining the necessary establishment for this purpose, would have been sanctioned had it been attached to a representation of

its urgency. A further report on this and the efficient cleansing of the station, with reference to queries 17 and 18, should be submitted.

The replies to the above and following questions, regarding conservancy, evince a want of local arrangement and control, and the matter must be attended to and specially reported on, if aid is required from Government, but it should be shown that this is absolutely necessary. Why bazaar establishments and local funds have not been raised, and whether the civil authorities have been applied to for prison labour and other assistance, to effect these improvements?

Answer.—Measures have been adopted, inasmuch as they are gradually being cleaned out or filled in.

Everything is being done as far as possible, but Jubbulpore wanted much cleansing, in consequence of a large Madras commissariat depôt having been there. The funds are small.

F. WHEELER, Brigadier.

Query 4.—The answer to query 4 is incomplete?

Answer.—Answered more fully.

Query 1.—Why has only one skittle alley been supplied, two per regiment being authorized? The commanding officer should refer to the executive engineer for the proper number for both infantry and artillery.

Answer.—*Vide* F., attached.

With respect to the concluding remarks made by the Quartermaster-General in the above letter, that the replies of the committee, as contained in the Sanitary Commission folio, evince a want of local arrangement and control, I beg to observe that I only took command of the station on the 5th March last, and cannot therefore be answerable for what was done prior to that date. The work which has been done since I am prepared to point out. Local funds have since that date been raised and are being worked upon, as coolies can be procured, prison labour not being available.

I have the honour to be, Sir,
Your most obedient Servant,
W. W. TURNER, Colonel,
Commanding Jubbulpore.

To the Deputy Assistant
Quartermaster-General,
Saugor District, Saugor.

C.—JUBBULPORE DIVISION OF PUBLIC WORKS, MILITARY DEPARTMENT.

Estimate No. of 1860-61.

Estimate framed by Lieutenant F. A. Howes, officiating executive engineer Jubbulpoor Division of Public Works, of the probable expense of draining and filling up to the level of the surrounding ground two tanks, one of which is situated about 200 yards south-east of the artillery hospital close to the soldier's gardens, and the other to the east and close to the irregular cavalry lines at present occupied by the detachment Alexander's horse, agreeably to the accompanying copy of letter No. 490, dated the 6th instant, from the station staff officer.

Jubbulpore, 14th September 1860.

SPECIFICATION.

The tanks to be filled in to the level of the surrounding ground with earth excavated from the bunds.

DETAIL OF WORK.

	ft. ft. ft.	ft.		
Tank south-east of the Artillery Hospital -	600 × 550 × 5·0 =	1,650,000		
	300 × 60 × 1·5 =	27,000		
	275 × 75 × 1½ =	23,203		
			1,700,203	
	Total cubic feet of earth work			1,700,203

Detail of Work—*cont.*

	ft. ft. ft.	ft.		
Tank close to the Irregular Cavalry Lines -	365 × 245 × 5·0 =	447,125		
	280 × 48 × 2·5 =	30,100		
	390 × 75 × 2·5 =	73,125		
	210 × 47 × 2·5 =	24,675		
			575,025	
	Total cubic feet of earth work			575,025

ABSTRACT OF EXPENSE.

1,700,203	Cubic feet of earth work to tank situated to the south-east of Artillery Hospital at 4r. per 100 cubic feet - - -		-4,250	0 0
575,025	Do. do. to tank situated close to the Irregular Cavalry Lines at present occupied by Alexander's horse, at 4r. per 100 cubic feet - - - - -		1,437	0 0
	Total cost, rupees		5,687	0 0
	Add contingencies at £5 per cent. - -		284	0 0
	Total rupees		5,971	0 0

FRED. A. HOWES, Lieutenant,
Officiating Executive Engineer,
Jubbulpore, Dept. Public Works

D.—STATEMENT showing the NUMBER of MEN of H.M. 97th Regiment, occupying the several Ranges of Barracks as understated on 1st April 1860.

Barrack.	Number of Men occupying.	Length.	Breadth.	Mean Height.	Remarks.
		Feet.	Feet.	Feet.	
No. 1 - - -	—	307·5	20	33 -	In use as a temporary hospital.
„ 2 - - -	100	307·5	20	33	
„ 3 - - -	102	307·5	20	33	
„ 4 - - -	—	307·5	20	33	Occupied by artillery.
„ 5 - - -	—	307·5	20	33	
„ 6 - - -	101	307·5	20	33	
„ 7 - - -	101	307·5	20	33	
„ 8 - - -	38	307·5	20	33 -	Occupied by 38 men of band and drums, also serjeants' mess, school, and library and reading room.
„ 9 - - -	101	307·5	20	33	
„ 10 - - -	101	307·5	20	33	

Jubbulpore, 18th September 1860.

W. W. TURNER, Colonel,
Lieut.-Colonel, Commanding 97th Regiment.

No. 187.—E.

SIR, Jubbulpore, 19th April 1860.

IN forwarding the annexed copy of a letter from the executive engineer relative to the occupation of the new military hospital at this station, I have the honour to make the following remarks for the information of the brigadier commanding the district, in view to his submitting the same to the Right Honourable the Commander-in-Chief, should he deem it expedient so to do.

It will be observed that the executive engineer anticipates that the building in question will be ready for occupation by the 20th May next. The 97th regiment arrived in the station on the 5th March, and it was then anticipated that the hospital would be ready for occupation in a month or six weeks; but as it was in very nearly as forward a state as it is now, I am apprehensive that the 20th of May will not see it fit for occupation unless more energetic measures are adopted to ensure it.

On the 5th March the hospital was floored, roofed, and all but tiled; the surgery, store-house, cook-house, and privy walls up and partially roofed; and at this present time the hospital is no further advanced, with the exception of a part of the foundation for the verandahs; while the roofing of the surgery, store-houses, cook-house, and

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privy is not yet completed. The tiles of the hospital have also been shifted to substitute others of a better make.

The unfinished state of this hospital necessitated the taking up of No. 1 barrack for the accommodation of the sick, leaving only seven others for eight companies, band, drums, regimental school, reading room, and serjeants' mess, in all 651 men. These barrack buildings were built to contain 100 men each; but they are not in reality large enough for more than 80*, and as we have upwards of 100 in each, I am apprehensive of serious consequences to the health of the men.

They already show that this overcrowding is being attended with ill effects; and if they show this in the strong breezes which now prevail, and insure an ample supply of fresh air, what will they not show when the still, stifling heats of June, July, and August are upon them?

I have, &c.

(Signed) W. W. TURNER, Colonel.
Lieut.-Col., Commanding H.M. 97th regiment.

The Assistant Quartermaster-General,
Saugor district, Saugor.

(True copy.)

W. W. TURNER,
Lieut.-Col., Commanding H.M. 97th regiment.

Extra accommodation could not have been built this year; some buildings being even now, in September, unfinished.

F. WHELER, Brigadier.

SURGEON'S REMARKS.

Jubbulpore, 19th April 1860.

THERE can be no doubt that the present overcrowded state of the barracks occupied by the 97th regiment is causing steadily-increasing sickness, and that sickness will rapidly increase,† unless the evil is speedily remedied. Overcrowding of the barracks, moreover, involves overcrowding of the wash-houses, latrines, and urinals attached to them, which for this reason cannot be kept in a sufficiently clean or sanitary condition.

(Signed) A. MACRAE, Surgeon,
H.M. 97th regiment.

(True copy.)

W. W. TURNER, Colonel,
Lieut.-Col., Commanding H.M. 97th regiment.

No. 407.—F.

SIR, Jubbulpore, August 10th, 1860.

I HAVE the honour to request you will bring to the notice of Brigadier Wheler, commanding Saugor district, the great want that exists of suitable places of recreation for the soldiers of the 97th regiment. There is but one skittle alley, and that so small that only one match can be played at a time; I would suggest, therefore, that a ball court, and carpenters' shop should be erected.

I am induced to bring this matter thus prominently forward, in the belief that places of recreation and amusement at the barracks, would prevent numbers from going to the bazaar to seek change from the monotony of barrack life, and considerably reduce the list of crime.

At present they have but one small table and three forms in each barrack, and have consequently to eat their meals in a comfortless fashion on their cots.

I have, &c.

(Signed) W. W. TURNER, Colonel,
Lieut.-Col., Commanding 97th regiment.

The Assistant Quartermaster General,
Saugor district, Saugor.

(True copy.)

W. W. TURNER, Colonel,
Lieut.-Col., Commanding 97th regiment.

Skittle allies have been ordered, but not a ball court, as the site for permanent barracks is not fixed on.

(Signed) F. WHELER, Brigadier.

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* They are four feet narrower than is usual.

W. W. TURNER, Colonel,
Lieut.-Col., Commanding 97th regiment.

† It has not increased, except venereal.
September 1860. F. WHELER, Brigadier.

FEROZEPORE.

Accommodation - European Troops - Artillery, 148; 1 Battery Foot Artillery.
Infantry, 1,000; including 200 for the Arsenal.
Native Troops - Cavalry, 1 Regiment.
Infantry, 5 Regiments.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The general aspect of the country is sterile and desolate-looking. Very little natural vegetation. Few trees, and the villages are thinly scattered. It is a dead level; the soil for the most part consists of sand and alluvial clay; the former predominates. There is very little wood; the waste ground is thinly covered with low jungle. The Madar plant abounds. Very little water is seen. 2. The station is 720 feet above the sea, the adjacent country about the same level; but the surface of the country appears to have a fall westward of nearly 1½ feet per mile. The nearest water is the river Sutlej, 3½ miles distant. The station occupies the highest ground in the district. 3. The nearest mountain is Kangra, 90 miles distance, and 6,000 feet above the level of the sea. 4. A nullah runs close to the back of the station, and is dry, excepting after heavy rain. There is no water nearer than the Sutlej. There is a considerable overflow of water in the vicinity of the station, after heavy thunderstorms, in the hot weather, lasting from 12 to 48 hours. There is broken ground and small ravines, produced by the rush of water after a heavy fall, but which rapidly run dry. No water pits are near the station, and nothing to produce disease. 5. The station is open from without on all sides; the roads running through it are about 70 feet wide. Gardens surrounded by mud walls 4 feet high are attached to most of the bungalows; in the gardens, trees are cultivated, but nothing is allowed to interfere with ventilation. A powerful eastern sun, with a hot wind blowing during the day, will, no doubt, produce sun-heat reflection; but thatched bungalows, the prevailing mode of structure, with mud walls, well apart, will moderate the effect. There are land winds, but no sea breeze. During the summer months, frequent dust storms arise with great violence from every quarter, without rain, loading the atmosphere with dust, which, on subsiding, leaves the air pure, and contributes greatly to the healthiness of the station.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	6. The surrounding country is principally cultivated; there are no works of irrigation. Irrigation, as pursued by the native agriculturists by means of wells, is not deemed to be unhealthy, but the station is not within the influence of any. Rice is not cultivated in the district, nor is indigo, hemp, or flax.
	7. The city of Ferozepore, with a population of 14,000, is situated 2 miles from the station.
	8. The geological structure is sand and alluvial clay, free from rock and stone. The station occupies ground which was formerly cultivated by the residents of the city, but has never before been occupied by population.
	9. Water is usually found in the dry season 24 feet below the surface, and during the rains at 23 feet.
	10. The district is free from surface springs, and the rain-fall sinks into the subsoil, and so drains off, leaving the ground free from evaporation. There is no higher adjacent ground, the drainage from which can affect the station.
	11. The water supply is derived entirely from wells sunk beneath the surface to from 28 to 30 feet. Every care is taken to prevent any impurity draining into the wells. The station is particularly free from all nuisance or malaria.
	12. Water is plentifully supplied; it is remarkably pure, colourless, free from smell, almost tasteless, and very transparent. Although not free from some combination with earthy matters, it possesses the quality called softness, which renders it suitable for culinary, washing, and other purposes, and is sufficient in quantity as well as excellent in quality. It is raised by means of leathern bags, a common and very efficient way of conveyance; and, on the whole, I consider the water as good as could be wished for.
	14. New stations are selected, after a careful examination of the country by those civil, military, engineering, and medical officers who have acquaintance with the district. A mixed committee of experienced officers in the several branches is appointed to examine and report on the most desirable site, for information of the Commander-in-Chief, who submits it, with his own opinion, for the final decision of Government.
II. Climate.	1. Common thermometers and rain gauges are the only instruments used at the station for conducting meteorological observations.
	2. Table of observation.

Five Years of Observation, from January 1, 1855, to December 31, 1859.

Months.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Sun Temperature.	Rain.	Winds. Direction.	Days of Sunshine.	Remarks as to Cloud, Dew, Winds, &c.
	°	°	°	°	°	In. cents.			
January	56·	24·8	72·2	45·4	95	1·06	N.E. & S.W.	20	Frequently overcast.
February	64·6	17·2	77·4	58·2	98	1·7	N.E. & S.W.	27	Dust storm.
March	76·7	26·4	88·9	62·6	103	0·56	N.E. & W.	28	Hail storm.
April	80·8	28·6	95·4	66·8	115	0·87	N.E. & W.	28	Dust storms.
May	97·	21·2	104·8	82·8	130	0·08	Variable.	30	Dust storms.
June	95·2	22·	105·8	83·8	125	1·13	N.W.; W.	28	Dust storms.
July	90·	21·6	101·2	79·6	130	6·13	N.E., S.E., & W.	25	Hot and dry.
August	86·	19·4	95·8	76·4	115	5·30	N.E. & W.	24	
September	86·4	18·2	95·8	77·6	108	3·56	N.W.	22	Variable temperature.
October	76·8	20·4	89·	68·6	118	—	W. & N.N.E.	30	Fair.
November	68·6	24·8	81·2	56·4	96	—	N.W. & N.E.	30	Steady weather.
December	56·2	21·	71·2	51·8	79	0·04	Variable.	31	Steady weather.

3. The climate is dry, free from any great variation or miasma. The cultivation of trees within the station, and that of vegetation generally without (where at first all was bare), have increased the rain-fall, and to some extent diminished the dust storms, moderating the excessive dryness of the air, and thus improving a climate which is naturally in favour of the European constitution. It is particularly favourable, health being preserved without any dietetic restriction, or peculiar manner of clothing or shelter being resorted to. The parade duties are for 1½ hour morning and evening in the cold weather, and in the hot season for a short period each morning at daybreak, as a matter of exercise and discipline rather than drill. From December to March inclusive are the most healthy months, and August and September the most unhealthy. Fevers, particularly those of the intermittent type, are the prevailing diseases, and in severe hot weather the men may suffer, though rarely, from attacks of heat apoplexy.

4. There is no district near the station so healthy.

5. The following are the principal stations on which I have served:—1. Barrackpore; 2. Sylhel; 3. Dinapore, in Bengal; 4. Cawnpore; 5. Lucknow; 6. Agra; 7. Delhi, in Hindostan; 8. Neemuch, in Malwa; 9. Ferozepore, in Punjab. The two last were the most healthy. Neemuch is a table land, 1,400 feet above the sea. The soil is of trap rock, intersected by black mould. The country stony, undulating, and irregular; easy of drainage; no great variation of temperature; European troops were not located there in my time. Lucknow will become a desirable place of residence for Europeans. Agra was never particularly healthy; was formerly the site of an ancient city; the water brackish, and injurious to vegetation; the heat great; its proximity to a large city objectionable; visitation by cholera frequent. The old site of the station at Delhi, destroyed by the mutineers, from its proximity to pestiferous marshes, from which the prevailing winds blow, but which nothing could remove, was decidedly injurious. The present site within the city walls, and a high ridge intervening between it and the low country, is comparatively healthy. Sylhel is very similar to Moulmein in dampness, rain, and low situation, and is suited to few constitutions. Barrackpore, though too relaxing, has become, by drainage and other sanitary means, comparatively healthy for a Bengal station. Dinapore and Cawnpore have always been considered unfavourable to the European constitution, though improved under sanitary measures.

FEROZEPORE. BENGAL.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station.	1, 2, and 3, map and plans. 4. Table showing the barrack accommodation. Date of construction of barracks:—Artillery, 1841–42 and 1855; Infantry, 1859. Total number of rooms:—Artillery, 3; Infantry, 24. Total regulation number of non-commissioned officers and men:—Artillery, 148; Infantry, 800.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
								Feet.	Doors.	Ft. in.	Ft. in.
Artillery Barrack, No. 1.—3 rooms.*	32	100	24	20	48,000	1,500	75	2	17	7 6	4 6
2. For Married Men -	12 Families	13	28	20	7,280	7,280	354 per family.	2	2	7 6	4 6
		Each family in two rooms.							2 windows	4 6	4 0
									Doors.		
3. For Staff Mess, Library, Stores, &c.	—	154	28	20	—	—	—	2	24	7 6	4 6
Infantry.—16 rooms -	50	95	44	20	84,040	1,680	80	2	16	7 6	4 6
Eight Dining Rooms -	—	65	26	28	47,320	—	—	—	4	7 6	4 6
Artillery Guard-Room	6	70	24	20	33,600	5,600	280	2	10	7 6	4 6
Prison Cells - -	6	14	8	10	1,792	1,792	112	2	2	7 6	4 6
Infantry Guard-Room	16	67	24	18	46,944	3,000	100	2	8	7 6	4 6
Prison Cells - -	14	10·5	8·5	18	1,606	1,606	90	2	2	7 6	4 6

* Inner verandah not included.

5. The barracks face north-east and south-west for the benefit of the prevailing winds. They have no windows, but are well provided with doors on all sides.
   A 12 feet verandah surrounds the building.
   No one is allowed to use the verandah as a sleeping quarter. Jalousies or jhilmils are not necessary in the Punjab.
6. The bedsteads are wooden frames and legs, with rope or tape plaited across for the mattress.
7. Tents are of one wall with double roof, made of strong country canvass. The outer or upper roof consists of three layers of cloth; the inner of two cloths, and the walls of three.
   Each tent is for 16 men. The superficial area is 320 feet, or 20 square feet to each man.
   The cubical contents 2,560 feet, or about 160 cubic feet per man. (Sketch annexed.)
8. The barracks have ridge ventilation.
   Skylights or upper windows are used for buildings of every description, and for tents which have no ventilators, the sides around may be raised from the ground when more air is required than four doors (one in each side) will admit of. The ventilation is quite sufficient. The air is cooled by tatties, which are universally used, and consist of screens made of the scented root, kus-kus, and sufficiently thin to admit of a current of air through it. These are placed in each doorway (previously fitted) to the windward, and kept constantly watered. The cost of each tattie is seven rupees, and 10 of these can be watered for a monthly outlay of 15 rupees. Punkahs are also in constant use during the hot season in all barracks. They are pulled by the hand, at a monthly cost of $10\frac{1}{2}$ rupees for 20 beds. The structure is a wooden frame covered with cloth, with a cotton fringe attached, and suspended from the roof.
9. Most public buildings are constructed of burnt brick, with lime and mortar. Tents are of strong country canvass.
10. Floors are constructed of brick and mortar, raised 3 feet above the ground.
11. I consider that nothing could be better than the present construction.
   The executive engineer performs the principal, and the barrack-master all petty repairs, within a reasonable time after a requisition is made.
   The senior medical officer present is the responsible sanitary officer. At his suggestion and recommendation, all necessary measures are carried out under the orders of the commanding officer. Walls and ceilings are cleansed and lime-washed once a year, and whenever found necessary.
12. The lavatories consist of small rooms, with floors of brick and mortar, adapted for receiving and draining off the water into the subsoil outside, so that the men may freely bathe themselves, as well as use earthen vessels for the purpose of cleanliness. The water is kept in earthen vessels, provided by water carriers.
13. The usual country mode of cooking, is by fires on the ground, with side walls of mud about a foot high and 9 inches apart for supporting the vessel. The native dhobie (or washerman) washes by the wells and dries the clothes on the spot, in the open air.
14. The contents of the privies and urinals are carried off by sweepers, and buried outside the cantonment.
15. They are ventilated by ridge ventilation as well as openings in the walls on all sides.
   Country oil lamps are used for lighting all buildings requiring it.
16. No drainage is required, as all refuse is carried off by sweepers employed for the purpose. The arrangements for this purpose are quite sufficient. The buildings are free from dampness. All refuse is removed to a distance, but water from the bath room is allowed to sink into the subsoil. Pits are allowed for the temporary holding of refuse from the cook-houses, three feet in diameter, and conveniently near, but at a distance from wells. These are daily cleaned. They are between 200 and 300 yards from the nearest quarters. No foul ditches are permitted to exist.
17. An establishment of sweepers with refuse carts are kept for the purpose of daily sweeping up and removing refuse of every kind from the station.
18. The surface of the cantonment is kept free from vegetation by an establishment of coolies attached to the executive engineer's department. No old walls, thick hedges, or anything interfering with the ventilation of the station, are permitted.
19. The bazaar consists of one-story houses in lime, with verandahs in front for shop purposes, and open streets for free circulation of air. No drainage is necessary, as all refuse

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	is removed. Water is supplied from wells. Latrines (or spaces enclosed with mud walls) are kept at a distance and out of the influence of the prevailing winds, but the natives generally prefer going a distance in the country for the purpose. An establishment of sweepers is kept at the expense of the bazaar itself for removing all refuse, and preserving due cleanliness under the authority and supervision of the bazaar master. A better arrangement I could not suggest. The native houses consist of mud huts with flat roofs and an entrance door only. Native houses are not allowed sufficiently near the station to have any influence whatever on the barracks or station itself. 20. Slaughter-houses are located quite away from barracks, but within the neighbourhood of the sudder bazaar, and out of the influence of the prevailing winds. The offal is buried outside the station. 21. The number of horses kept is so very small that no particular place for picketing them is appointed, but the owners are allowed to keep their cattle in the rear of their houses, the manure and refuse being removed by bullock and buffalo keepers, or brick burners who eagerly seek it. 22. No stables are provided at the station. The horses are picketed in the open air, about 500 yards from barracks and 1,200 or more from the hospital. Dung heaps are not allowed. Manure and refuse is disposed of by the native stable assistants as explained above. The stable litter is at the disposal of the public works department, if they require it for the purpose of burning brick. The horses are arranged in double rows. The ground sloping from head for drainage purposes, the huts for the native assistants are in line close by. 23. The married men in the artillery are supplied with separate barracks, two rooms and bath room for each family. Those of the infantry occupy corner rooms attached to the barracks, and are not hutted with the men.
Officers' Quarters.	1. There are no public quarters for officers. They occupy private rented bungalows.
IV. Health of the Troops.	1. The district throughout is particularly healthy. 2. The native population suffer mostly from diseases of which venereal is the primary cause. Ulcers, cancers, diseased bones, leprosy. Fevers of the intermittent type are prevalent during the wet season from exposure, of which sleeping out of doors is too common. Splenetic diseases are comparatively few. Urinary calculi very prevalent in the male of both children and adults from the age of three years, but the cause is not very evident, unless their inveterate use of molasses in its crude and impure state accounts for it. 3. I attribute the healthiness of the population to the dry state of the atmosphere, the absence of water surface, the purity of the drinking water, and no excess of vegetation, all which are favourable to a people who habitually expose themselves at all times and under all circumstances to the open air. 4. It is two years since the whole of the European troops now at Ferozepore came from Peshawur, where the principal number had been located two and some five years. Fevers and bowel complaints were very prevalent at that station, and the men on first arrival at Ferozepore suffered from the effects of the Peshawur climate, but they are now as healthy as any troops in India. There is no perceptible difference as to healthiness in the different portions of this station. 5. The troops do not go into camp unless it is preparatory to a march, or in case of severe sickness, and when the medical authorities deem such a move to be necessary. 6. I have had no employment in hill stations. 7. I believe the constitution is better able to resist the effects of febrile and other diseases after the return from hill stations to the plains, supposing it to take place in the winter, which is the usual time. Any emergency which would recall the troops to the plains in the hot season would have an opposite effect. The purity and bracing qualities of the hill air permitting the European to take out-door exercise at all hours cannot fail to renovate the constitution. On the other hand, those in the plains at the same season must confine themselves to their quarters for eight hours daily in a temperature of 90° and upwards, or suffer exposure outside to a destructive heat with an irresistible desire for drink. 8. I highly approve of the hill stations for troops. The climate is particularly beneficial as a restorative to those from the plains who may be free from actual disease. 9. I am not aware of any diseases peculiar to hill stations. They are not considered desirable climates for chest and heart complaints, nor do I think generally speaking the hills are favourable for actual diseases of the internal organs. 10. Damp and cold are the only attacks to be guarded against, for which flannel clothing and good shoes are necessary. 11. The seasons best adapted for residence in hill stations are from the 15th April to the end of October. A residence throughout the year is found to be very beneficial for debilitated constitutions, but the difficulty in affording protection from the inclement weather, and the necessary confinement to the house, would make a winter residence in the hills unadvisable for troops. I recommend nothing short of six months. 12. There is certainly no period of residence in the hills beyond which injury is likely to be inflicted on the health of troops on returning to the plains. 13. Nothing more is necessary than the ordinary precautions for preserving health on leaving hill stations for the plains. 14. An occasional location in the hills (every third or fourth season) would be preferable, besides being equally conducive to the health of the troops; it would keep the men acclimatized and better able to resist the climate when circumstances rendered their exposure to the heat necessary. The climate varies so much in different stations in the plains that too frequent change is highly objectionable, excepting in sickly localities. The general health of troops improves by a prolonged residence, and even in stations considered sickly it is sometimes noticed that sickness decreases as the system becomes habituated to the climate. 15. I believe the barracks at hill stations to be in all respects suitable for the troops. 16. I have had no opportunity of judging at what elevation the most suitable sites may be obtained. 17. There is no higher ground near this station. 18. I have found those stations in which the surface and subsoil admit of ready percolation to be the most healthy.

FEROZEPORE. BENGAL.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	19. The best age for soldiers proceeding to India is from 19 to 22, and the period most suitable for landing is from November to the end of January, so that the troops may be comfortably settled at their quarters before the hot season commences. Every measure likely to promote the health is adopted in the disposal of troops on first landing. Exposure should be strictly avoided, and temperance in point of eating and drinking, especially the latter, enforced. 20. Troops should be sent direct to India to the healthiest stations, which experience shows to be in the Punjab. They should go to the hill districts during the hot season after landing. 21. The transport is by railroad, river steamers, bullock trains, or by regular marches, according to circumstances. 22. A British soldier should serve in India from 12 to 15 years. 23. The manner of conducting medical boards is such as to avoid conflict of opinion. I have no suggestions to make. 24. The beginning of the year is the best time for invalids to leave India, so that they may have the advantage of cool weather for reaching the place of embarkation and arrive in England at the beginning of summer.
Diseases.	1. The men are inspected once a week for the discovery of disease. 2. Scorbutic disease is scarcely known at this station. Two mild cases occurred in 1858-59 amongst 1,058 admissions into hospital. It is occasioned by impaired constitution, for which, removal to a hill station, and other suitable measures, would be desirable. 3. From the 1st April 1858 to 31st March 1859 there were 23 cases of hepatic disease out of 1,058 admissions; and, in the remaining nine months of 1859, 10 cases to 968 admissions, attributable, according to circumstances, to exposure to heat and chills, produced by sudden change of temperature, cold stages of fever, intemperance, exposure to night air when imperfectly clothed, after the sequelæ of dysentery and fever. 4. Dracunculus is seldom met with amongst Europeans, though with natives it is very prevalent in some localities; it is rarely seen in this district. Eight admissions for dranunculus appeared in H.M. 24th Foot during May and June 1858, on its arrival from Peshawur, the only cases since the regiment landed in India, on the 27th August 1846. 5. In the years 1858 and 1859, 395 cases of venereal disease were treated, out of 2,026 total admissions. 6. The troops suffer from epidemic diseases, such as fevers, principally of the intermittent type, 674 admissions to 2,026; 6 deaths. Dysentery, 48 admissions to 2,026; 1 death. No cholera nor small-pox. Rheumatism, 189 admissions to 2,026; no deaths. 7. The character of zymotic diseases differs in no particular manner from that in other localities. They are most prevalent during the hot and subsequent rainy seasons. The atmospheric conditions are those in which there is great variableness, such as intense heat by day, followed by damp and chilly nights, &c. The sanitary state of the bazaar, or native dwellings, differs in no wise from other portions of the station. Intemperance and exposure are the chief predisposing causes of zymotic diseases. 8. I am not aware that the soldier's duties, &c., at this station have any special influence in producing epidemic diseases. 9. Quinine, as a general rule, answers well as a prophylactic in 5 grain doses. 10. I have no recommendations to make with regard to the prevention of epidemic disease.
V. INTEMPERANCE.	1. The soldiers at this station, as a body, are temperate, though exceptional cases, as in all large bodies of men, occasionally occur. From 1 to 2 per cent. is about the proportion of confirmed drunkards. 2. The admissions to hospital directly caused by intemperance were five, to a total of 2,026, in the years 1858 and 1859. It is difficult to arrive at any correct conclusion in regard to disease indirectly caused by intemperance, considering how frequently it leads to the production of other diseases. Drunkenness is punished as an offence under the authority of commanding officers. 3. Distilled spirits are sold only at the canteen. It is country distilled rum, 24 per cent. below London proof. Each man consumes two measures (about 6 oz.) of rum and 1 pint of malt liquor, or 1 of the former and 2 pints of the latter. Malt liquor is preferred in the hot season. Spirit is no part of the daily ration; the men pay for it and drink it at the canteen. It is not provided on march; and in the field it depends on circumstances. They may get it free of expense at the discretion of the officer commanding during severe exertion or exposure. It cannot be had before morning parade. Spirits are never given as a ration to convalescents. No other drinks injurious to health are sold at the canteen or bazaar. 4. Spirits in moderation, if not directly injurious to health, are certainly not conducive to it, but rather act prejudicially, promoting the habit of dram drinking, and lastly lead to excess. They are not conducive to discipline. 5. The discontinuance of the sale of spirits in the canteen and bazaar would be advantageous, provided no other means are available for procuring its substitute in shape of native distilled liquor, which of all description of drink is the most destructive. Putting an end to the use of spirituous liquors would necessitate the absolute abolishment of every sale of bazaar and country drink. 6. I consider a moderate use of beer (porter is rather heavy) to be conducive to health. The difficulty of procuring wholesome wine, free from adulteration with raw spirits, deters me from recommending it for troops. 7. Tea and lemonade are in great demand in the hot season, and coffee in the cold months. Soda water is not available for the men on account of its expense. It is desirable in every point of view that the men should be encouraged to depend more on this class of drinks during the hot and thirsty season than on spirituous liquors. 8 and 9. The supply of Government spirits is a much less evil than that the men should drink native distilled liquors. If the latter can be effectually suppressed I am confident that the substitution of beer, tea, or coffee, &c., would materially benefit the health of the troops. 10. I would recommend that a coffee and other refreshment shop on a large scale, with reading room attached, should be provided for European regiments, in which might be included workshops, &c.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	11. The following are the canteen and bazaar regulations:— 1*st Battalion H. M. 24th Regiment.* Rules for the Canteen of the above Corps. *Noon.*—1 pint of beer or 1 dram of rum. *Evening.*—1 pint of beer and 1 dram of rum. *Note.*—In the event of a soldier not drawing either beer or rum at noon he may draw 2 drams of rum in the evening, at half an hour's interval between each dram. (True copy) J. Tongue, Lieut. and Acting Adjutant, 1st Battalion H.M. 24th Regiment. Regulations affecting the purchase by European soldiers, &c., of liquor in Military Cantonments. Extract from the Abkaree lease for the sale in cantonments of spirits manufactured after the native method. No. 11. You shall never, without written authority from the officer commanding the station, under any pretence at all, sell liquor to European soldiers or non-commissioned officers, whether with their regiments, or on staff employ, such as road, commissariat, or ordnance serjeants, nor to their wives, or any members of their families, nor to any person whom you may have grounds of suspecting of an intention to convey it to such persons. The first infringement of this rule will subject you to a fine at the discretion of the superintendent cantonment Abkaree, not exceeding 500 rupees, and for the second offence you are liable to lose your contract, and forfeit your security money. C. Darnell, Capt., Superintendent of Cantonment Abkaree. Extract from the form of licence granted to merchants for the sale within cantonments of liquors of all descriptions, whether imported or country made. III. That no liquor whatever is to be sold to European soldiers, their wives, families, or servants, or to non-commissioned officers, or soldiers with regiments, or on staff or civil employ, without a pass signed by their immediate commanding officer and countersigned by the superintendent of cantonment Abkaree. (*Vide* Circular, No. 34, from the officiating financial commissioners for the Punjab, dated Lahore, 19th April 1859.) (True extract) C. Darnell, Capt., Superintendent of Cantonment Abkaree. The canteen regulations are strictly obeyed, and no man can get more than what is allowed. The bazaar rules on these subjects are also carefully attended to.
VI. Diet.	1. The composition of the ration is the same both for British and India troops, viz.:—1 lb. bread, 1 lb. meat, 1 lb. vegetables, 4 ozs. rice, 2½ oz. sugar, ⅝ oz. tea, 3 lbs. firewood, 1 oz. salt. Coffee may be substituted for tea, or may be supplied on alternate days. Tea is preferred in the hot weather. In serving the meat such parts of the animal as are more than two-thirds bone are excluded from the ration. Potatoes and English vegetables are supplied when in season, at other times (in the hot weather) such native vegetables as are procurable. At this station potatoes cease on the 1st May until the new crops arrive from the hill districts about September or October. A native pumpkin is the best substitute for English vegetables. The ration is daily inspected by the quartermaster and officer on duty before issued, and if disapproved of it is changed by the supplying contractor, or should he object the articles are sucmitted for approval or otherwise to an inspection by a committee of three officers, one being medical. 2. The ration allowed already described is considered complete, but the men may supply themselves with extras at their own expense. The have three meals daily, at 7, 1, and 6 o'clock. Breakfast, meat grilled, bread, butter, eggs, sometimes soogee is preferred by the men. Dinner, boiled or roast, curry, puddings and pies. Tea, bread and butter. 3. I consider no improvement in the ration necessary. Each company is divided into a certain number of messes, and each mess is under charge of a corporal who superintends the cooking and disposal of the rations. 4. One system of cooking is in use throughout the country for officers as well as men, and consists of copper vessels covered with a thin coating of tin, the latter requires renewing twice a month at the cost of one rupee for every 16 vessels. This apparatus is more efficiently managed by native cooks than the complicated and costly English mode. Roasting is performed by a wood fire on the ground. The kitchens are clean, well ventilated, and sufficiently supplied with water. The food is boiled, roasted, or stewed with vegetables, or made into pies, according to the wishes of the men. Every attention is paid to the cooking. Tea and coffee are also properly prepared. Tea or coffee with refreshments are generally provided for the men half way on each march by the regimental cooks, who go on ahead for the purpose of preparing it. 5. A large and very productive garden is attached to the infantry barracks at this station. It is superintended by gardeners selected from the regiment with native assistants. It is supported partly from regimental funds, and partly by the sale of the surplus produce.
VII. Dress, Accoutrements, and Duties.	1. The dress and accoutrements of the Queen's British army and European troops in this Presidency are in accordance with the regulations of the Horse Guards, with the exception that in the hot season the men are clothed in a complete suit of American drill dyed khakee (earth colour), with basket-made helmets covered with the same. The present dress is suitable to the climate, and I have no improvement to suggest. The guard dress is the same as for ordinary duties. In wet or cold weather men on duty wear a woollen cloth great coat; in the hot season European sentries are in the verandahs or under other shelter.
Duties.	1. It would be most advisable that the men should be thoroughly drilled at home, which would obviate the necessity for a good deal of exposure to the sun, which is at present unavoidable. 2. The amount, duration, and time of drill, vary according to the season of the year and other circumstances. They are not calculated to affect the health prejudicially; the best time is as soon as possible after morning gun-fire, in order to avoid exposure to the sun. Each regiment has its own orders about the hours of march. For the year 1859 each man had five nights in bed during the week, but this must vary according to circumstances.

BEROZEPORE, BENGAL.

References to Subjects and Queries.	Replies.
VII. *Dress, Accoutrements, and Duties—Duties—cont.*	3. The regimental guards are mounted close to the barracks, and one detachment of about 120 men, European infantry, is furnished weekly to guard the arsenal, about two miles from barracks. The duration of a guard is 24 hours; each soldier remains on sentry two hours at a time, when he is relieved and gets four hours' rest; he again takes two hours, and so on. As three men are allowed for supply of one sentry, so each man has four hours' sentry duty, both day and night. The following are the usual roll calls:—1. Morning parade. 2. Breakfast. 3. In summer at 10 a.m. to warn the men not to quit barracks till evening. 4. Dinner, 1 o'clock. 5. About half an hour before sunset. 6. Tattoo. 7. Check calls, according to direction of commanding officers, to see that all men are present in bed. No particular detrimental effect is caused by night guards.
VIII. INSTRUCTION AND RECREATION.	1. The means of recreation and instruction at the station consist of ball courts; skittle grounds; schools with good schoolmasters; library and reading room, sufficiently lighted; 1 soldiers' garden; theatre; gymnasium. No day room nor workshops. The two latter combined would, I think, be an important inducement for occupying the men during the heat of the day. Strict attention is paid to prevent as much as possible the men exposing themselves when off duty. 2. The only improvement I would suggest is that previously named of providing a coffee shop with reading room, and including workmen's shops. 3. A savings' bank already exists. 4. It is not advisable that the men should take exercise during the day in the hot season.
IX. MILITARY PRISONS.	1. There are no military prisons at the station. The regimental cells (attached to the main guard) do not comprehend any defect which might be prejudicial to health.
X. FIELD SERVICE.	1. There are no local regulations for field medical service. 2. The medical officer's powers are guided by the regulations as regards marches, camping, &c. 3. Permanent camping grounds exist throughout the country, and when practicable the healthiest sites are selected with reference to all points of a sanitary nature. 4. The arrangements for field hospitals, transport of sick, &c., are laid down in the medical code.
XII. HOSPITALS.	1. Plan of hospital. 2. The infantry hospital is situated about 450 yards in rear of the barracks; the artillery hospital about 500 yards to the right of them; and the horses are picketed to the left of the barrack; and distant from the hospital about 1,200 yards. The hospitals are sufficiently removed from the bazaar and far from houses. Both are in open situations with nothing of any description to interfere with free ventilation. The infantry hospital and barracks are situated on the highest ground. Those of the artillery, though not so high, are healthy, and all are kept free from everything objectionable. 3. Wells of good and wholesome water are provided within the grounds of both hospitals. 4. No drainage is required, all refuse being removed by an establishment of sweepers and filth carts. Water from the bath rooms is allowed to sink into the subsoil. 5. The hospitals are of one story, with thatched roofs, floors of brick, raised 3 feet above the ground. The roof water sinks into the subsoil. Drainage is not necessary. The heavy rain-fall runs off to a distance, and the soil is generally so dry and of such a nature that the ordinary falls sink rapidly into the subsoil. The hospital is built of brick and mortar, with single roof and ridge ventilation; thatched of sufficient thickness to protect the hospital from heat. Twelve feet verandahs surround the buildings with always sufficient shelter from the sun's rays. The verandahs are used for walking exercise morning and evening. The hospital consists of one story only. The following table shows the hospital accommodation:— Date of construction, 1846. Total number of wards: artillery, 3; infantry, 4. Total regulation number of beds artillery, 44; infantry, 144.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
					Feet.			Feet.		Ft. in.	Ft. in.
Artillery, No. 1	20	60	24	23	38,160	1,900	72	2	3 windows	3 6	3 0
No. 2	16	43	24	23	27,348	1,700	66	2	26 doors	7 6	4 6
No. 3	8	22	24	23	13,538	1,692	66	2			
European Infantry, No. 1	36	108	24	22	5,700	1,600	72	2	2 windows	3 6	3 0
									21 doors	7 6	4 6
No. 2	36	108	24	22	5,700	1,600	72	2	Do.	Do.	Do.
No. 3	36	108	24	22	5,700	1,600	72	2	Do.	Do.	Do.
No. 4	36	108	24	22	5,700	1,600	72	2	Do.	Do.	Do.

Due attention has been paid in placing the hospital to give it the full benefit of the prevailing winds. The hospitals have no windows, but are provided with opening doors about 7 feet apart on all sides, which admit of suitable ventilation.

6. The ventilation is by means of doors and ridge ventilation, already explained, which acts efficiently. Jalousies or jhilmils are not allowed, nor deemed necessary.
7. Punkahs and tatties, as already described, are provided during the hot months, and at some stations, when the heat is excessive, a thermantidote (on the same principle as the fan blasts used for *iron* furnaces) for each ward is employed, in addition to the other means. The cost is from 50 to 80 rupees, according to size, worked by the hand at 7 rupees monthly.
8. Warming is secured by ordinary chimney fireplaces for wood, two to each ward. The walls and ceilings are cleansed and limewashed once a year, and oftener if necessary.
9. The privies and urinals are similar to those described for barracks; they are conveniently situated, and approached by covered verandahs. The filth is removed by sweepers and carts

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	employed for the purpose. No cesspits are permitted, and free use of lime and wood ashes is made for keeping the place pure and free from offensive smells. 10. Small bath rooms are constructed in the verandah corners, which in the infantry hospital are very deficient for the number of sick. 11. Warm and cold baths are ordered for the sick when the medical officer considers it necessary. 12. The native washerman requires no house, but prefers washing in the open air. 13. The storage is perfectly dry and sufficient. 14. The bedsteads are wooden frames with tape plaited across for the mattrass. (For the bedding, see medical code.) 15. The kitchen is a detached building, at a distance from the wards, with means and apparatus similar to those described for barracks. 16. Forms transmitted. 17. The attendance on the sick is performed almost solely by natives. There is a hospital serjeant to all European hospitals. In cases of extreme sickness, or whenever deemed necessary by the medical officer, a soldier is appointed to attend upon and assist in the care of a patient. 18. The sanitary condition of the hospital is excellent. No epidemic, gangrene, or pyœmia have appeared. 19. There are no deficiencies or sanitary defects, except the insufficiency of lavatory accommodation in the infantry hospital. 20. The infantry regimental garden adjoins the hospital grounds, and has seats for the use of those sick and convalescents who may have permission from the surgeon to take walking exercise. The artillery has nothing of this kind. 21. Separate wards, with a native attendant, are provided for the sick women and children. The present arrangements are satisfactory. 22. There are no special local hospital regulations. 23. The requisition of the medical officer on sanitary measures, repairs, &c., receives immediate attention from the local authorities, and on other points his powers are guided by medical regulations. 24. There are no convalescent wards or hospital, nor do I consider such necessary.
XIII. Burial of the Dead.	1. There are two burial-grounds for British troops on the boundary line of the station, favourably situated as regards the prevailing winds. One is conveniently situated for the infantry, and the other for the use of the station generally. 2. The area of the burial-grounds is 450 and 297 feet square respectively. The soil and subsoil are similar to that already described. Drainage good. The grounds are carefully kept, and decomposition takes place readily. 3. The graves are 3 feet wide by 7 long, and with 3 feet between each. They are 6 feet deep, and no grave is ever reopened. According to the season, burial takes place from 12 to 24 hours after death, and during epidemics as soon as possible. With respect to natives; Mahomedans inter immediately after death in burial-grounds of their own. The bodies of Hindoos are burnt without delay. 4. The grave-yards are never offensive. The practice of burial in regard to British troops is according to regulations. 5. The dead of camp followers and bazaar people are disposed of out of the station, as explained above. 6. No injury to health accrues from the present practice. 7. I can suggest no improvement in regard to burials.

(Signed) Chas. S. Reid, Colonel, H.M. Bengal Artillery, Commanding at Ferozepore.
G. S. Cardew, M.D., Surgeon-Major.
Henry Blair, Lieutenant Executive Engineers.

June 1860.

SEALKOTE.

Accommodation.
- Queen's Troops.
  - Artillery, 1st Troop, 3rd Brigade, Bengal Horse Artillery.
  - Cavalry, 7th Dragoon Guards.
  - Infantry, 71st Highland Light Infantry.
- Native Troops. Infantry, Ferozepore Regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is flat, but rising towards the hills on the north, and falling towards the south. The soil is alluvial generally, but there are many barren and uncultivated parts. There is no wood, jungle, or water in the vicinity. 2. The station is elevated about 900 feet above the sea, but is almost on the same level as the adjacent country. The highest point in the station is 16 feet above the bed of the north nullah, and 14 feet above the south. There is no higher or healthier ground adjoining the station. 3. The nearest mountain land, which is 1,000 feet above the level of the station, is 30 miles distant. 4. The Chenab river is 10 miles north of the station, and the Ayke river two miles east. The vicinity of the station is not liable to overflow of water. There is a spot on the south-east where water lodges, and which becomes marshy in the rains. It has no perceptible effect on the health of the station. 5. The station is a narrow parallelogram, and is open and freely exposed to the winds. The ventilation is excellent. The temperature of the station is raised 2° or 3° by reflected sun heat. In consequence of its proximity to the hills, the station is exposed to sudden gusts and

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References to Subjects and Queries.	Replies.
I. Topography—*cont.*	to much variation of temperature. Colds and rheumatic complaints are frequent at such times. 6. The country surrounding this station is cultivated. The crops are all grown by irrigation from wells worked by the Persian wheel. Cultivation is distant upwards of one mile from the centre of the cantonment on the north and south, and nearly two miles on the east and west. Irrigation has not been observed to have any effect on the health of the station. There has never been any epidemic here since the establishment of the station in 1849. Beyond the limits above stated any crop may be grown; within these limits nothing is permitted. Indigo is not grown near the station, and hemp is cultivated beyond the above limit, so that no inconvenience is experienced from it. N.B. At this station an additional portion of ground from that usually set apart at other stations was given round the boundaries by order of Sir Charles Napier, on which only the cold weather crop is allowed to be cultivated, and during the hot season it remains fallow. This, doubtless, is one of the causes of the very great salubrity of this station. 7. The city of Sealkote is distant about two miles and a half from the station. 8. The station occupies partly new ground that had not been under cultivation, partly cultivated land from which villages were removed to make way for the cantonment. The soil is light and free, with a good deal of sand; the subsoil is sandy. 9. Fifty-three to fifty-four feet is the depth at which a permanent supply of water can be obtained. Water is met with to a small extent about 30 feet from the surface. The average depth throughout the station in the rains is 41½ feet. 10. The station is remarkable for the rapidity with which water drains off, both from its situation raised between two nullahs, always dry except when rain falls, and the nature of the soil, which does not retain water on its surface. Twenty-four hours after the heaviest rain it has almost all disappeared. No drainage from higher ground passes into the subsoil of the station. 11. The water supply of this station is derived entirely from wells, which are not liable to pollution from leaves or other impurities falling into them. 12. The water is very pure and free from colour, taste, and smell generally; some wells are impregnated with soda. It is hard, containing a considerable portion of sulphate of lime, very free from impurities, clear and sparkling when drawn, and decidedly good. The supply is abundant at about 40 feet from the surface. It is raised by means of a rope and leathern bucket. No better supply could be obtained. 13. Doubtless the proximity of this station to the hills, at a sufficient distance to avoid the reflected rays of the sun, yet near enough to benefit by the rain attracted by them, has an influence on the temperature, and then on the general health. There are, however, influences at work which are at present undeveloped, which have hitherto made this station particularly suited for European troops. 14. New stations, whether on hills or in the plain, are selected by a board of experienced officers, medical and military, under the orders of the Commander-in-Chief. There seems no better mode of selection than this, if any effort is made to come to a knowledge of the facts, and due time given for inquiry. In the selection of this station one fact was most particularly noticed by the board, the number of children and their freedom from disease of the spleen, showing an immunity from fever. This was the evidence given by the country people themselves.
II. CLIMATE.	1. The following instruments are in store at the medical depôt for conducting meteorological observations, viz., electrometer, 1 set; electrophane, No. 1; hygrometer, No. 1; and anemometer, No 1. 2. The instruments for and records of former meteorological observations were lost or destroyed at the time of the mutiny.

TABLE of Meteorological Observations.
From January 1859 to December 1859.

Months.	Mean Maximum.	Mean Minimum.	Mean Sun Temperature.	Winds, Direction.
January	63°	51°	72°	E. & W.
February	66°	51°	77·5	W.
March	80°	58°	98°	W.
April	89°	67°	115°	E.
May	94°	74°	120°	Variable.
June	98°	81°	123·5	E. & N.E.
July	93°	80°	124·5	E. & N.E.
August	92°	78°	114°	Variable.
September	91°	72°	113·5	N. & E.
October	86°	64°	110·5	N. & E.
November	76°	60°	98·5	Variable.
December	64°	54°	86°	Variable.

3. The climate of the station is remarkably healthy and suited to the European constitution. The air generally dry, notwithstanding that a greater amount of rain falls than five miles more south. This is to be ascribed to the excellent drainage. As stated before, the climate is very variable, June, July, and August being very hot. The monsoon is not very heavy; but the cold is very great in December, January, and February, and for five months of the year. No climate in the world can be finer. The air is particularly free from dust and impurities. The troops, consequently, are remarkably healthy. It is necessary at all times to be ready to put on a cloak or great coat. Flannels are particularly called for at this station, and the men must not be too rigidly kept to the clothing of the season, as during the rains a woollen coat may at times be worn with advantage. Short drills may be given all the hot months at an early hour with advantage to the men. The most unhealthy months are August, September, and the commencement of October; the remaining months are very healthy.
4. There is no healthier district near the station.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	5. The following is a list of the stations at which I have served:—

Healthy Stations.	Unhealthy Stations.
Sealkote.	Dinapore.
Jhelum.	Barrackpore.
Patna.	Benares.
Thyetmyo.	Gorruckpore.
Bareilly.	Peshawur, in 1850 to 1853; has lately been considered very healthy.
Rawulpindi.	

III. Sanitary Condition of Station. 1, 2, 3. Plans of the station, surrounding country, and barracks, are transmitted.

4. Table of Barrack Accommodation.

Dates of construction of barracks, 1850, 1851, and 1852.

Total number of rooms or huts, 67.

Total regulation number of non-commissioned officers and men, 100 for each barrack range.

Barrack Rooms.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
12 ranges of Barracks, each containing as follows:—											
Artillery Division Lines.				Under trusses.							
No. 1 range, 3 rooms -	100	2 × 100 × 1 × 87	24	28	192,864	1,928	91	1½	50	2¾	5¾
No. 2 range, 4 rooms -	100	3 × 48 × 1 × 56½	24	24	115,488	1,154	89	1½	50	2¾	5¾
European Infantry Lines.											
Nos. 1 & 3 ranges, 6 rooms.	200	48	24	28	192,536	1,925	102	1½	50	2¾	5¾
Nos. 2, 4, 5, 6, 7, 8, 9, & 10 ranges, 6 rooms each.	800	48	24	24	155,888	1,558	102	1½	50	2¾	5¾
Total - -	1,200										
Guard Room - -	20	65½	18	Under Beam. 20¾	24,464	1,223	59	1½	14	2	4½
Prison Cells - -	23	15	7	14½	1,522	1,522	105	1½	23	2	3¾

5. The windows are on opposite sides of the main wards. An enclosed verandah runs round the building, 12 feet wide, 17 feet high; also an outer arcaded verandah, 12 feet wide and 15 feet high. The inside verandah on one side of the barracks has been since 1858 generally occupied as sleeping quarters by the men. There are no jalousies or jhilmils.
6. There are two sorts of cots in use in the barracks; tape and string bottomed cots. The former, a very complicated sort of bed, and difficult to clean; the latter, a vile description of bed, which should never have been admitted into barracks, because it cannot be kept clean, and affords shelter for bugs and all sorts of vermin. The bedding consists of a cotton-stuffed quilt, carpet, and blanket. The same remarks apply to hospital beds as to those in barracks. An iron-framed bedstead, as used in England, with canvass, laced or put on with straps, would be much better than the beds now in use at Sealkote.
7. The tents used in camp are constructed as follows:—Staff serjeant's tents, single poled, superficial measurement, 15 feet by 15 feet; cubic measurement, 1,687 feet for one staff serjeant. Private's tents, double poled, superficial measurement, 24½ feet by 19½ feet; cubic measurement, 3,819½ feet; calculated for 16 men, giving for each man an area of 14 feet, and cubic space of 238 feet.
8. There are ventilating apertures along the ridge of the barracks, &c.; also 50 upper windows in the main wards. The ventilation is sufficient to keep the air pure by night as well as by day. The only means for cooling the air of barrack-rooms are tatties or screens of kus-kus and punkahs, the former cost about 3 or 4 Rs., the latter 5*s*.
9. The barracks are constructed of sun-dried bricks, faced with pucca brick. The roofs are trussed, covered with bamboo frame-work, mats, 3-in. thatch, and tiles.
10. The floors are of paved brick, and are raised about 3 feet from the ground.
11. The materials employed in the construction of barracks, huts, and tents are very suitable to the climate, and avoid iron on account of the heat. The repairs are done by the Department of Public Works immediately the necessity for them is reported as apparent. There is a sanitary (medical) officer in the station. All buildings are whitewashed annually, and oftener if deemed necessary, as a sanitary measure.
12. Water is supplied from wells, and all waste water is conveyed into open cesspools, and thence by carts removed out of cantonment. There is a wash-room to each barrack, or 12 in the station; also three plunge baths. The water from these is generally used for gardens, irrigating purposes, &c. A sketch of the lavatories is transmitted.
13. A sketch of the barrack cook-room is transmitted. No means of cooking are provided at this station; the cooks use the native chulas on the floor. The refuse water runs into open

SEALKOTE. BENGAL.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station.—*cont.*	cesspits, and is removed by carts. The washing and drying of the linen are performed at a distance from the station by native washermen. 14. Sketch of the privies and urinals is transmitted. The urine is conveyed into cesspits and removed by carts. The ordure from the pans is emptied into filth carts and removed. 15. The barrack doors, which have a glass fan-light, and the upper windows, afford ample light by day, while at night oil lamps are used. 16. The drainage of the lines is by means of channels, leading into side drains of the roads. There are no sewers, cesspools, &c., every offensive matter being removed by carts. The drainage is ample for all purposes. No part of any building used as a barrack or hospital is damp. There are no cesspits or foul ditches near the station. 17. The arrangements for the surface cleansing of the cantonment are most efficient. All refuse is removed by means of carts to a distance from the station. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c. interfering with the ventilation of the station or bazaar. 19. The sanitary condition of this bazaar, which has been laid out on a very large scale, with broad streets, admitting of a thorough ventilation, is excellent. It drains itself by a great slope, carrying off everything into the nullah running south. It is well supplied with numerous large masonry wells, filled with good water. The bazaar, from its great size, and owing to the mutiny, is only half filled, so that there is no possibility of crowding. It is very clean, being kept so by sweepers and water carriers. On the right and left have been erected large and commodious latrines for males and females. A large number of sweepers and bheesties, employed at the expense of the shopkeepers in keeping the bazaar clean, are daily inspected by a non-commissioned officer (the bazaar serjeant), who reports to the officer in charge, who himself frequently inspects the bazaar in every direction. All filth, rubbish, and sweepings are carried away beyond the cantonment limits. No improvement whatever in any respect is practicable in this bazaar with reference to the financial difficulties of the state. The native houses are constructed of dried mud, and are very well adapted to the wants and means of the class of people they are occupied by. There are no dung-pits, heaps, or cesspits. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. The slaughter-house is half a mile from the infantry barracks. It is superintended by a a warrant or non-commissioned officer, and inspected constantly by the executive officer. The offal is buried, and the blood, after being mixed with water, is run off into a cesspit with a narrow mouth. The slaughter-house is kept quite clean, and I have had no hint that it proves a nuisance to any one. 21. There is no stabling for bazaar horses. There are about half a dozen horses belonging to shopkeepers, who keep them picketed in their respective compounds. The camp followers' horses amount to about 20 or 25. They are picketed in the open plain, half a mile from the station. These places are kept perfectly clean by the bazaar sweepers, and are under the supervision of the bazaar serjeant and European officer in charge. The manure is burnt as fuel by the camp followers, who are very poor. 22. There are no stables or dung-heaps, all manure being removed. Picketing grounds for horses consist of raised earthen terraces, about 100 yards in front of their respective barracks, and away from the hospital. 23. There are sufficient quarters for all the married non-commissioned officers and privates to live separately. No married people occupy barracks with the men.
Officers' Quarters.	Officers are not provided with quarters at Sealkote.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining native population are healthy. 2. Rheumatic disease is the most prevalent among the native population. Spleen disease is not at all common, and, except small-pox, epidemics are unknown. 3. I attribute the healthiness of the native population to the absence of exciting causes of malaria and the openness and dryness of the country generally. 4. The 7th Dragoon Guards arrived at Kurrachee from England on 7th January 1858. From thence they proceeded by camel train to Hydrabad, from Hydrabad by river Indus to Mooltan; from Mooltan by bullock waggon to Mean Meer, where the last detachment arrived on the 31st March 1858. After remaining 14 days at Mean Meer the regiment marched from thence on the 15th April 1858, and arrived at Sealkote on the 21st. The health of the regiment at Mean Meer was pretty good, fever being the prevalent disease. The health of the regiment since it arrived at Sealkote, with the exception of the first hot season, when there were many deaths by fever, diarrhœa, and apoplexy, has been very good. The 52nd Light Infantry landed at Calcutta in October 1853. They were quartered at Chinsurah till all the detachments had landed, when they went to Allahabad by river steamers, arriving there in November 1853. The regiment marched for Umballa on the 19th December 1853, and was quartered there for six months, leaving on the 1st August 1854 for Subathoo. At Subathoo five months, from 10th August to 1st December 1854; at Umballa three months, from 6th December 1854 to 10th March 1855; at Meerut, nine months and a half, from 26th March 1855 to 8th January 1856; at Lucknow, two months in camp and nine months in quarters, from February 1856 to 27th December 1856; at Sealkote, from 14th March 1857 to 25th May 1857; two months and a half moveable column, from 25th May 1857 to 14th August 1857; before, and in Delhi from 14th August to 4th October 1857, six weeks; at Jullundur from 30th November 1857 to 22nd April 1858, five months; at Sealkote from 30th April 1858, two years and three months. The state of health has been generally good since the arrival of the regiment in India, except in Lucknow, when it suffered severely from cholera, and also when before Delhi. The prevailing diseases have been fever, ophthalmia, and venereal; at Lucknow cholera; and at Delhi wounds. The average daily number of sick for the seven years has been 63, the lowest average being for the present year, $58\frac{2}{3}$; and the highest in 1857–8, viz., 68. The number of deaths since landing is 455 men and 7 officers; average $5\frac{50}{91}$ monthly, greatly increased, of course, at Lucknow and Delhi. No portion of the men's present accommodation is more unhealthy than the rest. 5. The troops at this station are never camped out. 6, 7. I have never been in charge of troops at hill stations. 8. Troops do better in the plains than hills where the station is healthy. The men are more efficient and less liable to bowel affections.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	9. Bowel complaint is peculiar to the hills, and with which troops are liable to be attacked on going to them. 10. More attention to the water and the avoidance of chills by the use of flannel and other warm clothing are the precautions to be observed by men going to hill stations. 11. From the 15th April to the 15th October is the season best adapted for residence in the hills. Troops should remain above six months, except for particular cases in which advantage may be obtained from a residence in the winter. 12. Troops should always return to the plains before winter, unless under particular circumstances. 13. Troops should have clothing adapted to the plains on leaving hill stations. 14. Where stations are healthy in the plains, it is no advantage to quarter troops in the hills. An occasional change to a hill station may certainly benefit a regiment, especially one which has been some time in India. It has, however, not yet been shown that European cavalry corps, which never are quartered in a hill station, are less efficient in any way than infantry corps, which take their tour at these stations. Frequent change of station is doubtless beneficial to convalescents; but unless a regiment proves sickly, not to the troops in general. 15. The only hill station in this circle is Dhurmsallah, where the accommodation is sufficient for the number of troops sent. 16. Cannot say what ranges of elevation above the sea are most suitable for hill stations. 17. Ludda, a most desirable spot two nights' dak, or 50 miles in the Himalaya range, might be advantageously occupied as a hill station. 18. I have no experience to say what classes of surface and subsoil are the most healthy for stations. 19. The best age for soldiers to proceed to India is from 20 to 25 years, and they should land there at the end of October. The 7th Dragoon Guards, on landing at Kurrachee on 7th January 1858, were quartered in a thatched barrack, and it being the cold season, the men were exercised morning and evening in the usual cavalry drills. Suitable clothing was issued to each man. Generally, on first landing, troops, after being placed in barracks, are provided with the light clothing suitable to the country. There is usually scarcely any drill on first arrival; but the duties are taken as they always are, and it depends chiefly on the season of the year as to whether a regiment marches up the country, or stays at the port of disembarkation. In order to preserve the health of recruits on first landing in India, I should send them up without loss of time to join their regiments. 20. There is no advantage in sending troops to intermediate stations instead of direct to India. They should be sent to the most healthy stations first. 21. The 7th Dragoon Guards marched from Kurrachee to Hyderabad by camel train, and this mode of conveyance was generally liked by the men, as being both safe and comfortable. From Hyderabad to Mooltan the regiment was conveyed by steamer up the Indus, and from Mooltan to Mean Meer by bullock waggon. The latter mode of conveyance was particularly disliked by the men as being tiresome, dusty, and unpleasant. Generally troops landing at Calcutta are sent by rail to Raneegunge, thence to Allahabad by bullock train, and from thence they march to their destination. From Kurrachee they are sent in steamers up the Indus to Mooltan and march from there. On the steamers the men are continually on deck, there being no place below for them, except a small one in the flats generally used as a hospital. If a man catch any infectious disease, there are no means of separating him from his comrades. 22. A British soldier should not serve more than eight years consecutively in India, without a change to a more temperate climate. 23. The manner of conducting medical boards is such as to cause no conflict of opinion as regards invaliding. 24. Invalids should leave India for home in the months of December, January, and February.
Diseases.	1. Once a week the men parade by troops and companies for doctor's inspection, with their shirt fronts, open sleeves rolled up above the elbow, and trousers above the knee, and bare feet. The hour varies with the season of the year, at present it is 6·30 a.m. 2. Little or no scorbutic disease is traceable in the records of the regiment over a period of two or three years. 3. About one case in 50 of those treated is the proportion of hepatic disease at this station. It is not the result of other diseases, but of intemperance or climate. 4. No cases of dracunculus have occurred at this station. 5. The proportion which venereal diseases bear to all other diseases is about a fourth. If marriage must be limited, I would suggest the passive recognition of measures such as obtain in continental Europe. The establishment of lock hospitals would be decidedly advantageous. 6. The troops at this station suffer from ephemeral fevers, and slight attacks of dysentery and rheumatism. Of 948 cases treated in hospital for the year, there were of the diseases of the epidemic and endemic class one in 2·87. The mortality was one in 110. 7. Of the zymotic class of diseases, rheumatism is the most common at the station. Fevers of the typhus or typhoid type are almost unknown, and the same may be said of cholera, small-pox, and the exanthemata generally. Diseases of the above class are more likely to prevail in the hot and wet season, when want of occupation may probably render the men more liable to attacks. No striking atmospheric changes have been observed to precede or accompany these diseases. The sanitary condition of the bazaar is good in every way, and the buildings are not crowded. These diseases chiefly arise from negative causes. Want of occupation may probably offer weak points to the assaults of the above diseases, also a want of sufficient care in guarding against sudden changes of temperature. 8. The duties in cantonments are not such as would be likely to operate unfavourably on the health of the troops. In reference to field duties, they must necessarily in a great measure be beyond control; but I am not aware of any deficiencies which affect the soldiers' comfort while so employed. 9. Fever is not so in excess at this station as to call for the use of quinine as a prophylatic, so with this view it is not used. 10. The ordinary hygienic precautions so familiar to all are strictly carried out here. Beyond these the present crude state of sanitary science admits of no suggestions of any practical use.

SEALKOTE. BENGAL.

References to Subjects and Queries.	Replies.
V. INTEMPERANCE.	1. The men at this station are decidedly temperate, and the proportion of men who may be called confirmed drunkards is about three per cent. 2. Intemperance exists to a very small extent in the regiments at this station, and cases of delirium tremens are very rare. Hepatic and other diseases supposed to be influenced by intemperance are few, and seldom have been found to have any apparent connexion with previous intemperate habits. Drunkenness is always punished as an offence. 3. Only rum supplied by Government is sold at the canteens, and native spirits in the bazaar only. Rum is issued at 24 per cent. below London proof, that is, 76 parts spirit and 24 parts water. The average amount consumed by each a man a day is one dram, but some men never drink spirits. Spirits form no part of the ration in the station, nor on the march as a rule, though a dram is sometimes served out to the men after a wet march, when waiting for the tents to come up. In the campaign in 1857 the men used to get either rum or coffee half way on the march. Before Delhi it used to be served out to the men going to the trenches before starting, about 4 a.m., and to the others at 6 a.m. In either case hot rice water was given with it to those who liked it, and was found very beneficial on account of the hard work the men had to go through. In station or on the march no man as a rule can get spirits till after evening parade. Some convalescents are allowed to the canteen, and others not, according to the surgeon's instructions. They never get spirits as a ration. No drinks other than intoxicating drinks are sold in the canteen or bazaar. 4. The consumption of spirits by troops and convalescents is most injurious to health. It should never be offered for sale at all, as men are induced to take spirits who never would if it were not handy to them. It is prejudicial to the efficiency and internal discipline of a regiment. 5. I would abolish the sale of spirits, undoubtedly, as part of the ration, as it tends to drunkenness. Under no circumstance, except those of extraordinary fatigue, should it be issued to the men. 6. Malt liquor or wine is good in comparison with spirits, when taken in moderation. 7. A great deal of coffee is drunk by the men; nearly all take a cup before going to morning parade. This weather a good deal of "pop" is consumed, but tea, lemonade, and soda water are not much in requisition. Their influence on the health is good, but care must be taken to make all these of good quality and palatable to the men. 8. Spirits might be issued with good effect under particular circumstances, such as exposure to damp, cold, or extraordinary fatigue. 9. It would be decidedly beneficial to prohibit the sale of spirits in the canteen, and to permit only beer, tea, coffee, &c., to be sold, if so doing does not induce the men to look after and drink bazaar spirits. 10. The price of beer should be lowered, as at present a dram of rum costs 1 anna, while a pint of beer or porter costs 1½ annas. It would be well at any rate to cheapen malt liquor, as now the men are often induced to take rum in consequence of the price. Some system ought also to be introduced to compensate for the profit (8 annas a gallon) which now arises from the sale of rum, the commissariat furnishing it at 2 rupees per gallon, and the men drinking it at 2 rupees 8 annas, thereby forming a fund out of which the canteen establishment is kept up, games of all kinds and newspapers be furnished for the men, the extra expenses of married soldiers on the march defrayed, &c. &c., the loss of which would be severely felt. Beer being retailed at cost price does not produce any fund. 11. The canteen regulations prohibit the sale of any spirits in the canteen, except those furnished by the commissariat. The canteen is opened from after evening roll call until tattoo; but malt liquor is allowed to be drawn daily at the rate of one quart per man for dinner. No intoxicated or disorderly soldier is allowed in the canteen. Two drams of rum or one quart of beer can be drawn by each man during the evening; but no man is permitted to get rum and malt liquor at the same time, nor is any liquor allowed to be taken out of the canteen, except that furnished to the men at dinner or that supplied to the serjeant's mess. By the bazaar regulations all persons residing in the bazaars, together with a list of their occupations, are registered by the interpreter of the regiment for the time being, in whom the charge of the bazaar is vested. The ground for the bazaar in camp is to be allotted in rear of the troops, but within the rear guards if possible; but in a station the regimental bazaar is never to be near the Suddar bazaar. The chowdrie is responsible that sufficient carriage is kept for the conveyance of four days' supplies for the regiment. Soldiers found ill-treating a shopkeeper or taking away his goods by force are immediately punished, and all disputes between the men of the regiment and the inhabitants of the bazaar are brought to the notice of the interpreter, who may, if he thinks proper, refer them to the commanding officer. The regimental police preserve order in the bazaar, whenever the men are allowed out of barracks, and prevent them from committing irregularities. Any native belonging to the bazaar found selling country spirits to the soldiers is to be immediately turned out.
VI. DIET.	1. The rations issued to European troops consist of 1 lb. meat, 1 lb. bread, 1 lb. vegetables, 2½ oz. sugar, 1 oz. salt, 4 oz. rice, 5/7 oz. tea, and 3 lbs. firewood. The men get mutton twice a week, and beef on the other days, tea and coffee alternate days, 1⅜ oz. of coffee per man, when issued. The vegetables vary with the season of the year; at present no potatoes are issued. The men get doll-pumpkins, onions, and others, according as they are procurable. The quartermaster and subaltern of the day inspect the rations, and the former sees them issued. Should any part be bad, the contractor is allowed to replace it by good rations. If he does not do so, the rejected material is condemned by a committee, and the contractor has to replace it, and he is fined by the commissariat officer for every committee held. 2. The soldier get his ration without any stoppage. He takes three meals a day, the hour of which vary with the time of year. Breakfasts from 7·30 to 9 a.m.; dinners from 1 to 2 p.m., and teas from 5 to 6 p.m. At breakfast and dinner the men get tea or coffee, meat and vegetables, and at tea, tea or coffee and bread only. An equal quantity of meat and vegetables enters into the constitution of the ration. 3. The ration is very good, but the men would prefer mutton oftener. An orderly man from each company receives the rations, stays in the cook-house all day, sees them cooked and issued, and is responsible that the cooks give the full amount to the men. Men are told off for the purpose of seeing that the rations are not improperly made away with. 4. Each company has a set of cooking utensils, which are tinned twice a month, consisting of boilers, frying pans, gridirons, and ladles. A side of a cook-house is allotted to each

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	bungalow. The natives, of course, cook the things in their own way. The cook-houses answer their purpose very well, and are washed out once a day and kept as clean as possible. The bheesties allowed are sufficient for bringing water from the adjoining wells. The men get their rations dressed any way they like, generally roast or boiled. The cooking is very fairly done and sufficiently varied. The tea is usually well prepared, but the coffee is not so good, as it is issued green. Stalls with coffee and biscuits are always prepared half-way on a march. 5. It would be a very good thing to establish gardens for the men. Before the mutiny there were very good ones here, and the men used to get plenty of vegetables. Now, there are only small strips along one side of each bungalow, where the men of each company cultivate what they please, and some have obtained a fair amount of vegetables and flowers. If a general garden were established, one or two men per company (gardeners by trade, if possible) would be struck off duty and put in charge, being allowed to sell the produce at a certain fixed rate to remunerate them for their labour. This would benefit the men and give them employment.
VII. Dress, Accoutrements, and Duties.	1. In the cold weather the cavalry wear woollen clothing; in the hot weather khakee; on guard, a dragoon wears his pouch, pouch belt, and waist belt, and carries his carbine on sentry. On mounted parades he wears his sword in addition. The infantry wear a cloth tunic or serge tunic and black trousers, calico or flannel shirt, according to taste (nearly always flannel, or at least a flannel belt). His accoutrements consist of pouch and waist belt and pouch, the latter to contain 50 rounds, though only 20 are carried in quarters. The belts and pouch weigh 4 lbs., and 50 rounds and caps 4 lbs. 10 oz. Taking the dress as a whole, it is very suitable to the climate and to the soldiers' different duties. Khakee is the most serviceable dress ever invented for the hot weather. It is the present guard dress, night and day, from 8 a.m. to 5 p.m. In the hot weather the guards are allowed to undress and the sentries mount in the verandahs of the guard houses. During the night, if it is wet, each sentry has a post assigned him under the nearest cover, and they wear their great coats.
Duties.	1. It would not be advisable to drill the men at home before sending them to India. 2. The following exercises, which are most beneficial to the health of the dragoons, take place at this station. Field drills, riding drills, and watering order parades, the latter for an hour, the drills from 1 hour to 1½ hours. Evening stables for an hour and a general parade once a week in the afternoon, which lasts an hour. Grooming is a very healthy exercise. No special orders or parade. The best time for drill in the hot season is before sunrise. Evening parades or drills ought to be specially prohibited during the hot season. On the march troops should always reach their ground before sunrise, from 1st April to 15th October, but during the other months it is immaterial. The men at this station have six and seven nights in bed during the week. 3. The farthest guard is about half a mile from barracks, the other quite close. The guards are relieved every 24 hours in the morning, sentries are on two hours at a time. The roll-calls are as follow, if there is no parade: one in the morning, and always at breakfast, dinner, and tattoo, roll-calls in the bungalows, with a roll-call parade every evening. There are none at night, except when any men are suspected to be absent, in which case the orderly serjeant goes round the bungalow. Night guards have no bad effects upon the men generally, though in the long run they may be trying to the constitution. The men ought all, I consider, to be made to wear flannel.
VIII. Instruction and Recreation.	1. The following are the means of recreation and instruction at this station, viz.: Ball courts, skittle grounds, schools with good schoolmasters. A library is provided by Government for each regiment, embracing books on general reading in history, biography, travels, and fiction. There is a reading-room, provided with chess and backgammon boards and dominoes, and 16 newspapers and periodicals are taken in. It is very well lighted at night. The library is open during the morning; the reading-room all day in winter, and in summer from 6 p.m. to tattoo. There is a large garden attached to the cavalry regiment, of which a serjeant has the charge. Each bungalow also has a garden alongside it and at the ends, the seeds and garden tools being provided by Government, who also grant prizes for the best cultivated. There are armourers', saddlers', tailors', and shoemakers' shops in work, and one man carries on the trade of a watchmaker. There is a theatre in the lines of both European regiments. There are no gymnasia, but I strongly recommend that these should be built. There are also cricket clubs in every company, and a regimental one; the men play a great deal in cold weather. The companies are supplied with foot-balls and quoits, the latter being a very favourite game. If the men choose to avail themselves of the means provided, they will have enough to keep themselves occupied during the wet season and heat of the day. 2. The men might be made to contribute much more largely than they do towards the equipment of a regiment, with great benefit to themselves. As there are men of every trade to be found, workshops of all kinds might be instituted. 3. Soldiers' savings' banks have been working for many years, and much to the benefit of the men. The amount at present deposited by the 52nd Light Infantry is certainly 8,000*l.*, if not more. 4. There are good double verandahs to every bungalow, where the men can take exercise when wet; and, except just in the middle of the day, there is always shade enough to allow the men to play skittles or quoits on one side or the other.
IX. Military Prisons.	1. The prevost is a very well-arranged building. The cells are clean, lofty, and well ventilated, and during the hot season the prisoners are allowed into the centre hall, into which all the cells open, and where there are punkahs swung. There is more room a great deal than is ever required.
X. Field Service.	1. There are no local regulations for field medical service not included in the General Presidency Regulations. 2. There being established camping grounds and hours for marching laid down by Government, the medical officers have not much power in the choice of them, nor is it necessary, except under unusual circumstances, for them to suggest alterations. 3. The general regulations as regards camping grounds, &c. &c., as laid down by Government, are good and efficiently carried out. The medical officer can suggest officially to the com-

SEALKOTE. BENGAL.

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	manding officer any changes he may think fit, and the latter can accept or reject them, on his own responsibility. 4. When it is found necessary to establish a general field hospital, and the site has been fixed upon by the commanding officer and superintending surgeon, the commissariat is ordered to supply forthwith all necessary stores and the proper proportion of servants; and the regimental hospitals being of course reduced, there are taken as much as possible from them, and such medical officers as can be spared are attached for duty. Doolies and hackeries are always supplied in this country for the conveyance of the sick, and accompany the rear of the column. Carriage for the conveyance of hospital stores is supplied by the commissariat, and camels are employed when procurable.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.
XII. HOSPITALS.	1. Plan of the hospital is transmitted. 2. It is about 300 yards from the hospital to the nearest barrack in the infantry lines, and 200 in the artillery lines from the artillery or dragoon stables. The hospital is well removed from the bazaar in the infantry and alongside of the regimental bazaar in the artillery lines. The site is perfectly ventilated and healthy as regards elevation, drainage, absence of malaria, &c. 3. The water supply is abundant and wholesome. 4. The refuse water and other impurities are removed from the hospital by carts, as in the barracks. 5. The floors of the wards, which are of brick masonry or terraced, are raised three feet above the ground. The roof water is carried out into the drains of cantonments. The drainage is ample, and water never lodges about the buildings. The hospital is constructed of brick masonry (kiln burnt). The walls are single, two and a half feet thick. The roof is trussed, of purlins, battens, flat tiles, concrete, and tiles. There is an inner enclosed verandah, 12 feet wide and 17 feet high. All round the outside there are open arcaded verandahs, 15 feet high and 12 feet wide; these afford ample shelter to the building. The inner verandahs might hold men if necessary. The buildings are on the ground floor.

TABLE of Hospital Accommodation.

Date of construction, 1852–53.

Total number of wards, 10.

Total regulation number of beds, 160.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
				Under truss of roof.				Ft.		Ft.	Ft.
No. 10	16	52	24	24¾	30,888	1,930	78	1½	84	1¾	5¾

The hospital is placed so as to receive the full benefit of prevailing winds. The windows open on central pivots of the best construction for ventilation and coolness.

6. Open ventilators along the ridge, and the windows are ample to keep the place sweet and clean. There are no jalousies or jhilmils. Outer chicks are supplied to the verandahs, and chick doors to the building.
7. Punkahs and tatties are used to cool the air admitted into the wards. Thermantidotes have been recommended, I believe, and are being constructed by the commissariat—design not known.
8. Fire-places are in each of the inner verandahs of each ward. The whole building is whitewashed twice a year, and four times to the height of six feet.
9. A sketch of the privies is transmitted. They are separate from the hospital, and only connected with it by an arcaded corridor. They are not offensive, all filth being daily removed by carts.
10. Washing-rooms are attached to each wing of the hospital. These have a plentiful supply of water laid on from the wells, from which the men get water for their basins and for the purposes of ablution.
11. In each room there are full-length baths for bathing the sick, and slipper baths are also furnished.
12. The clothes are washed and dried by native washermen at a distance from the hospital.
13. The storage is sufficient and dry.
14. Tape-bottomed beds only are being supplied now, but wooden cots in this country so harbour bugs that they are constantly broken by the men in their efforts to expel the vermin, and the repeated repairs required are most expensive. An iron cot made in England would prove economical to Government and a comfort to soldiers. I understand that new hospital bedding has been fixed on lately in Calcutta, although patterns of the new kind have not yet reached this.
15. The kitchens, which are separated from the hospitals, are similar to but smaller than those of the barracks.
16. Copies of the diet rolls, diet tables, &c. are transmitted.
17. One hospital serjeant is allowed in each regiment for attendance on the sick; but the number of permanent hospital orderlies should be increased. A requisition to the commanding officer for extra orderlies in severe cases is always attended to. Nurses are not employed at present, but I would strongly recommend their being so.
18. The sanitary state of all the hospitals at this station is highly satisfactory. There has been no epidemic disease in either of them.
19. Of the ordinary familiar sanitary measures, drainage is perhaps the only one which admits of further development, but even this may be said to be very fair, and water runs quickly off.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	20. Convalescents are carried out in doolies for air and exercise, and those who are able walk in the large enclosed hospital grounds. Elephants are also supplied for the convalescents. 21. There are excellent hospitals set apart for the treatment of women and children. There is also an establishment of native female servants in addition to the European nurses. The present arrangements are perfectly satisfactory. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations, such not having been found necessary. 23. With reference to the powers of the medical officer in all matters appertaining to the sanitary state of his hospital, repairs in buildings, diet, medical comforts, &c., every facility exists through the commanding officer of regiments and the superintending surgeon. 24. No separate buildings exist for convalescents discharged from hospital, nor do I think such necessary, but a portion of the hospital is always set apart for the treatment and isolation of any infectious disease.
XIII. Burial of the Dead.	1, 2. The burial-grounds used by British troops are on either flank and within bounds of cantonment, but are not to windward of the station. The areas are, infantry, 9,700 square yards, soil clay; artillery, 8,909 yards, subsoil light clay. They are drained by means of side channels to roads, which are carefully looked to. 3. Each grave is about 7 feet by 3 feet, and the space between them, which, however, varies, is generally 3 or 4 feet. They are 5 or 6 feet deep, and are never re-opened. In the winter burial takes place within 18 hours after death, and in the hot season within 12, and less if possible; during epidemics, as soon as possible after the heat of the day is over, and coffins can be prepared. 4. The grave-yards are never offensive. 5. The Mussulmans are buried in a grave-yard beyond the station boundaries, near the city. Hindoo corpses are burnt on the banks of the nullah outside the bazaar. 6, 7. Not the slightest injury accrues to the public health from the present practice, nor are any improvements to be suggested.

(Signed) P. M. N. Guy, Brigadier, Commanding Sealkote.
W. S. Dicken, Deputy Inspector-General of Hospitals, Sealkote Circle.
J. T. N. O'Brien, Major H.M.'s 20th Regiment, 1st Battalion Ex. Engineer, Sealkote Division, D.P.W.

21st December 1860.

RANEEGUNGE.

Accommodation { Queen's Troops—Infantry - - 1,120
Native Troops—Infantry - - 500

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is generally bleak, undulating, sandy, and occasionally swampy, with very little wood, jungle, or water in the vicinity. 2. The elevation of the station above the sea is 370 feet, but it is on the same level as the adjacent country, and about 30 feet above the nearest water. There is no higher or healthier ground adjoining the station. 3. The nearest mountains are a range about 30 miles off, the height of which is from 2,000 to 3,000 feet. 4. The nearest water is the river Dumooda, about two miles distant from the station; the vicinity is liable to overflow during the rains. There is no broken ground, ravines, or water-pits near the station worth mentioning. 5. The station is open, and freely exposed to the prevailing winds, and the temperature is not raised by exposure to reflected sun-heat. The winds also to which the station is exposed are generally salubrious. 6. The surrounding country is partially cultivated. There are no works of irrigation. The cultivation of rice is only prohibited in the cantonments. No cultivation of indigo is carried on near the station, nor is there any preparation of hemp or flax. 7. There is no large city, town, or native population in the vicinity of the station. 8. The surface and subsoil of the district consist of gravel, sandstone, and coal. 9. Water is usually found during the dry season at about 50 feet below the surface, and during the rainy season at a depth of 40 feet. 10. The rain-fall flows off readily, and there is no adjacent higher ground the drainage from which can pass into the subsoil of the station. 11. The water supply of the station is derived from wells, no tanks existing in the district. None of the wells are liable to pollution from any source. 12. The water supply of the station is equal to the demand, and the quality of the water is excellent, but it is rather hard. It is free from microscopic infusoria. Water for use is raised by buckets and so distributed. 13 & 14. No reply to these queries.
II. Climate.	1. The instruments available at the station for meteorological purposes consist of a thermometer, aneroid barometer, and rain guage. 3. The climate is generally healthy, with no great or unusual variability, but is subject to heavy storms of sand and dust. It has, however, no perceptible deleterious influence on health. The usual East Indian diet and clothing, with proper precautions against exposure,

RANEEGUNGE. BENGAL.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	are all that are necessary in this climate in the way of precautions. We have no statistics with regard to the most healthy or unhealthy months, but the end of the rainy season in Bengal is usually the most unhealthy. 4. There is no district near the station the climate of which is more conducive to health. 5. With the exception of Raneegunge, the stations (all civil) at which I have served were positively injurious, viz., Hoogly, Jessore, and Howrah.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Plans of the cantonments and district are transmitted. 4. Table of barrack accommodation.

Date of construction—No. 1, 1858–9; No. 2, 1854; No. 3, 1857, 1858.

Total number of rooms.

Total regulation number of non-commissioned officers and men.

Barrack Rooms, or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Men's Bed above the Floor.	Doors.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		Ft.	Ft.	Ft. In.			Nearly.	In.		Ft.	Ft.
No. 1, eight iron barracks.	128	310	40	18 1½	225,686	1,760	100	18	40	9	4
No. 2, ten small temporary, do.	20	90	17	12 0	18,360	918	76	18	12	7	4
No. 3, two south, do., do.	100	218	36	18 0	141,264	1,400	76	18	34	7	4
Guard room* -	18	50	18	19 0	17,100	950	50	18	10	9	4
		Measurement of each Cell.			Total.	To each Cell or Man.	To each Cell or Man.		To each Cell.		
Prison cells† -	20	15	7	15	31,500	1,575	105	18	1	9	4

* This measurement excludes dry room, serjeant's room, and verandah on three sides.
† Roof and side ventilation given extra.

5. The doors of the barracks are on the four sides of each building. There are verandahs five to six feet wide to each temporary barracks, but neither verandahs nor shelter of any description to the iron barracks. Verandahs are seldom used for sleeping quarters by soldiers or others except in the warm season at night. There are no jalousies or jhilmils.
6. Wooden cots laced with iron hoops are used in the barracks.
7. No reply to this query.
8. In the iron barracks sufficient ventilation is afforded by four openings. Open doorways ventilate the rest of the buildings. These means are sufficient to keep the air pure by night as well as by day. There are no artificial means used for cooling the air of barrack rooms.
9. The outer walls of the iron barracks are built of mud mortar and stone masonry, while the walls of temporary huts and barracks are of sun-burnt brick. The roofs are generally thatched.
10. The floors, which are of earth, are of an average height of three feet above the country level.
11. These buildings are only suitable for troops *en route*. More permanent buildings are required for a longer residence. The iron barracks require verandahs all round them to render them fit for permanent barracks. Repairs to barracks and cantonments are done quickly when urgent, and are executed by the cantonment magistrate, barrack master, or engineer officer. The walls and ceilings of barracks are cleansed and lime-washed once a year, or oftener if required.
12, 13, 14. No information is afforded in reply to these queries in reference to privies, wash-houses, and cook-rooms. The cleansing and drying of linen is performed at the tanks in the vicinity of the cantonment.
15. The buildings at this station are lighted by lamps, and in the barracks lanterns are used, having round open-topped edges.
16. The drainage of the barracks is easily effected from the sloping nature of the ground surrounding them. No part of any building used as hospital or barrack is damp. The fluid refuse of the barracks is carried away in filth carts and buckets. No cesspits exist near the station, nor any foul ditches within 1,000 feet of it.
17. Filth carts and sweepers are employed for the surface cleansing of the cantonment; extra hands being engaged when necessary.
18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c., interfering with the ventilation of the station or bazaar.
19. No drainage exists or is required in the bazaar, which is kept clean. The latrines are at a distance, and are not offensive. Water is supplied by water-carriers from the tanks. The small depôt bazaar is kept clean by sweepers. The condition of the native houses near the station is indifferent; pits and dirt heaps abound. No nuisance, however, is experienced in barracks from wind blowing over these native houses.
20. The slaughter-house is at a considerable distance from the barracks.
21 & 22. No replies to these queries.
23. There are no quarters at this station for married non-commissioned officers or men.

Officers' Quarters.

1. The officers' quarters are not good, but improvements are about to be made, and when these are effected, good doors, with glass, &c., ought to be supplied.

References to Subjects and Queries.	Replies.
IV. Health of the Troops.	1. The station, surrounding district, and adjoining native population are generally healthy. 2 & 3. Fevers, with occasional outbreaks of cholera, are the most prevalent diseases among the natives, which are attributable to their mode of living, and neglect of all sanitary precautions in cases of sickness. Their general healthiness may be ascribed to the clear and open aspect of the country. 4. There are no troops at the station. No portion of the men's accommodation is more unhealthy than the rest. 5. No reply to this query. 6 to 16. No experience of hill stations. 17. There is no higher ground within 30 miles of the station, and it is doubtful whether this hill (Pachete) could be occupied as a hill station. 18, 19, 20. No replies to these queries. 21. The mode of transport of troops from the port to this station is by rail, and on to the north-west by bullock train or marching. 22 & 23. No replies to these queries. 24. Invalids should leave India for home at such time as will land them in England in April or May.
Diseases.	1. There are no inspection parades for the discovery of incipient diseases at this station. 2. No cases of scorbutic disease have occurred here. 3. There are no statistics to show the proportion of cases of hepatitis usually under treatment, and since my incumbency there have been no cases of decided hepatic disease among the passing troops. 4 & 5. No reply to these queries. 6. This station is only used as a resting-place for passing troops, consequently this query does not apply to Raneegunge. 7, 8. No replies to these queries. 9. Small doses of quinine have not, I believe, been used as a prophylactic against malarial diseases at this station. 10. No reply to this query.
V. Intemperance.	1. The troops while here are temperate, but as they merely rest at the station *en route* no information can be afforded as to the proportion of confirmed drunkards. 2. No reply to this query. 3. Distilled sprits are sold in the bazaar, but there is no canteen at this station. Spirit is never given as a ration to convalescents. Beer and rum are provided by the commissariat, and ginger beer, but of indifferent quality, is sold in the bazaar. 4. The consumption of spirits in moderation is not injurious to the health of troops. 5. No reply to this query. 6. Malt liquor is the best beverage for troops. 7 to 11. No replies to these queries.
VI. Diet.	1. The ration for Queen's British troops and European troops in the Indian army is the same, and consists of 1 lb. meat (beef five times and mutton twice a week), 1 lb. bread, 4 oz. rice, 2½ oz. sugar, 5-7th oz. tea, or 1 3-7th coffee, 1 oz. salt, 1 lb. vegetables, 3 lb. firewood. A daily inspection of the rations is made by the orderly officer and the mess-men of the companies. 2. A complete ration, including 1 lb. potatoes, yams, onions, pumpkins, &c., according to the season, is provided daily for the troops, the stoppage for which is 3 annas 4 pie a day. 3. No improvement in the ration is necessary, since the men themselves are satisfied both with the quantity and the quality. No arrangements are necessary for preventing the disposal of the ration by troops. 4. Native cooks are employed to cook the ration, and pots are supplied for the purpose by the commissariat. The kitchens are built near the barracks, and the food is cooked according to the taste of the men, the mess-men see that it is properly done. No refreshment is given to troops before a march. 5. Gardens for the cultivation of vegetables by soldiers on a small scale could be advantageously established near the station.
VII. Dress, Accoutrements, and Duties.	No information under these heads.
VIII. Instruction and Recreation.	1. The only means of amusement at this station are two skittle-grounds. 2, 3. No replies to these queries. 4. There is not sufficient shade to enable the men to take exercise without injury to their health during the heat of the day.
IX. Military Prisons.	1. Some cells have lately been built at this station, and they seem well adapted for punishing the men without endangering their healths.
X. Field Service. XI. Statistics of Sickness and Mortality.	No information under these heads is afforded.
XII. Hospitals.	1, 2. There no stables or other offensive buildings near the hospital, which is distant 1,000 feet from the bazaar and houses of the civil population. The site is open and freely ventilated, and is healthy as to elevation, drainage, &c. 3. The water for use is good, but has to be brought from a distance. 4. Refuse water and other impurities are removed from the hospital in filth-carts and buckets. 5. The floors of the hospital are of solid earth, and the lowest portion is raised 18 inches from the ground. The roof water sinks into the subsoil, but the rain-fall is carried away by the natural slope of the ground. The hospital is built of brick, stone, and mud mortar masonry; the roofs are single, but the walls being thick and ventilation good, the building is sufficiently cool. There are verandahs all round, 6 feet wide, but they are never used for the accommodation of sick. The hospital consists of one flat.

RANEEGUNGE. BENGAL.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	Table of barrack accommodation. Date of construction, No. 1 - - - 1857. „ „ 2 & 3 - . 1860. Total number of wards, 3. Total regulation number of beds, 114.

Wards or Hospital Huts.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patients' Bed above the Floor.	Doors.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft	Ft.	Ft.			In.		Ft.	Ft.
No. 1 - -	40	90	20	17	30,600	765	45	18	12	7	4
No. 2 - -	60	118	36	20·5	87,084	1,450	59	18	30	8	4
No. 3 - -	14	55	18	12	11,880	848	70	18	10	7	4

Verandah measurement is excluded.

The hospital is so placed as to receive the full benefit of the prevailing winds. The doors are battened, and open outwards; Venetians would be much better for the purpose.

6. The morning and evening draughts keep the hospital cool both by day and night. There are no jalousies or jhilmils.

7, 8. There is no apparatus for cooling or warming the air admitted into hospitals. The walls and ceilings of the wards are cleansed and lime-washed every six months, or oftener, if required.

9. The privies have no cesspits; they are naturally drained, and are not offensive.

10, 11. The lavatory arrangements are sufficient for the sick, but no regular baths are provided for patients.

12. The washing and drying of hospital linen are done by native washermen at a distance.

13. The storage is very imperfect. A pucka building may become available, but at present it is not so.

14. Wooden cots, with crossed-iron hoops, are used in the hospitals, the bedding consisting of a mattress and cotton quilt.

15. The hospital kitchen is very imperfect; cooking is performed over fireplaces of kutcha-work.

16. A copy of the diet-tables is transmitted, those used are of the ordinary kind for European Indian hospitals.

17. A hospital serjeant with a native establishment is the attendance provided for the sick, but orderlies are also attached if specially required.

18. The sanitary condition of the hospital is good; no epidemic has ever appeared in the wards.

19. The hospital is sufficient for temporary purposes, but is far from being complete, the ventilation and lavatory arrangements being very bad. It is, however, very difficult to obtain good ventilation in a kutcha building.

20. No provision is made for exercising convalescents at this station.

21. Soldiers' sick wives and children would be treated in a separate building, which arrangement is satisfactory for the present small requirements.

22. There are no special local hospital regulations enforced at the station.

23. The powers of the medical officer in regard to matters appertaining to the sanitary state of the hospital, repairs of the buildings, change of diet, medical comforts, &c., are considered in the station as paramount.

24. There is no convalescent ward or hospital at Raneegunge.

XIII. BURIAL OF THE DEAD.

1, 2. The burial-ground for British troops is on the outskirts of the station, and to the leeward of it. The soil is gravelly, and the ground slopes well for drainage. This burial-ground will shortly be enclosed.

3. The grave space allowed is about 7×3 ft., with about 4 feet interval. The graves are about 6 feet deep, and are never re-opened, one body only being interred in each. Interment is compulsory at ordinary times within 24 hours, and during epidemics as early as practicable. There is no burial-ground for native troops.

4. The grave-yard is never offensive. In the absence of the clergyman an officer performs the burial service over a British soldier.

5. The dead of camp followers or bazaar people are burnt at a distance.

6, 7. No injury accrues to the public from the present practice, and no improvements in the disposal of the dead are required.

(Signed) R. C. GERMON, Brigade Major, Commanding.
C. PALMER, M.D., Surgeon.
EDW. ROOKE, Executive Engineer, 1st Div., Grand Trunk Road.

ROORKEE.

Accommodation—Queen's troops, Infantry, strength of 2nd Bengal Fusiliers - - - 487

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is a dry sandy plain, with low hills, occasional cultivation on three sides, and the Himalayas to the north. No wood or jungle exists in the vicinity of the station, but a canal runs through the cantonment. 2. The station is elevated only a few feet above the adjacent country, and no higher or healthier ground is to be found near. Roorkee is the highest spot in the neighbourhood, and is very healthy, except in September and October, when the houses nearest the low ground suffer. The native servants, especially, suffer from ague. 3. The Himalaya mountains are about 40 miles from the station, and the snow range is always visible in clear weather. 4. The canal which runs through the station is the nearest water, but there is some low ground to the north, which is marshy in the rains. It is now, however, and through the dry season, cultivated and dry. There is no broken ground or any water pits near the station except the low marshy ground already mentioned. 5. The station is generally very open, especially the barracks, but some of the private houses are too much enclosed with trees. The station is not exposed to an elevation of temperature by exposure to reflected sun heat, being too small and open on all sides. A cool wind in the hot weather, at night, comes from the hills on the north, and is very pleasant and healthy. 6. The country surrounding the station is cultivated. There is no irrigation near, except in private gardens, where it injures no one but the occupants of the houses adjacent. The soil of the station being sandy, no rice is grown in the vicinity, neither is there any preparation of flax or cultivation of indigo carried on near it. 7. There is a small native town about one mile from the station. 8. The soil of Roorkee is sandy on a substratum of coarse gravel. It has never been occupied by a population. 9. Water is never found nearer the surface than 40 feet, and during the dry season the wells farthest from the canal dry up. 10. The rain-fall sinks quickly into the soil, and does not lie on the surface. It drains off very quickly, and no drainage from higher ground passes into the subsoil of the station. 11. The water supply of the station is derived from the canal and the wells supplied by it; it is not stored in open tanks, none existing in the vicinity. 12. Plenty of excellent water is obtained from the canal, which is always very cold in the hottest weather, the water being derived from the snow which melts on the hills. It is soft, good, and very pure. Any well dug near this canal is plentifully supplied with pure water, by filtration through the intervening gravel and sandy soil. 13. The peculiarity of Roorkee is that its nearness to the snowy range brings it within the influence of the cool breezes and storms from the hills, which greatly temper its climate during the hot weather. A day hotter than usual is sure to be succeeded by a refreshing storm, which cools the air for many successive days. The cold wind which blows from the hills at night in the hot weather is also very refreshing and healthful. 14. New stations are too often selected only to protect civilians in the exercise of their duties near the larger towns; Peshawur, Kurnaul, Lahore, Delhi, Jhansi, Patna (*i.e.*, Dinapore) are all instances of unhealthy cantonments from this cause; it is, however, unavoidable.
II. Climate.	1. The means and instruments available for meteorological purposes are a rain gauge and a thermometer. 2. The following meteorological table is the result of observations taken from April 1860 to November 1860. 3. The climate of Roorkee is very healthy and quite equal to that of England, if estimated during the cold as well as hot months. From the 1st November to the 1st April nothing can exceed the healthiness of the climate, and during the hot months the heat is moderate and the sickness trifling. During 6 months of the year the open air can be enjoyed in a verandah or house with open doors both night and day. It is hot in the middle of the day in the sun, but exercise can be taken in the morning in the hottest weather, and our recruits were *always* at drill morning and evening without injury all through the past hot season. September and October at the drying of the rains are the most unhealthy months, fevers both intermittent and continued of a mild type being then prevalent. 4. There is no district near the station the climate of which is more conducive to health than that of the station. 5. I have served in almost every part of Bengal from Cabul to Burmah. The most unhealthy places have been Lahore, Delhi, and Fort William. Dinapore is also in some years, when the river overflows more than usual the surrounding country, very sickly.
III. Sanitary Condition of Station.	1, 2, 3. No replies to these queries. 4. There are 21 barracks, each 100 feet long, 10 feet wide, and 20 feet high, each holding without crowding 30 men. There are no windows, only wooden doors 8 feet by 4 feet. The regiment is not provided in Roorkee with regular guard rooms, &c. 5. The doors are on opposite sides and open inwards. There is a verandah on the east and west sides 10 feet wide, but I have never seen them used as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils to the barracks, only wooden doors with glass panes in the top. The hospital, however, has in addition to these doors, purdahs. 6. The bedsteads used in barracks are wooden frames with cotton tape weaved, for the centre. This can be washed, and these beds are the best possible for India, but when iron frames could be procured cheaply they would be an improvement, for bugs harbour in the joints of the wood, and cannot be dislodged without difficulty. 7. The tents are double poled, 16 feet by 12 feet area, 12 feet high to a slope of 5½ feet, which is the height of the side pieces. Each tent is calculated to hold 16 men. 8. Ventilation in the barracks, &c., is effected by means of holes in the ridge of the roof, which are covered by a raised thatch, sloping on both sides from the centre, also by small

ROORKEE. BENGAL.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	windows at the top of the walls on each side, east and west. In this station the ventilation is sufficient; in other stations I have seen it often very imperfect. The air admitted into the barrack rooms is cooled by means of punkahs and tatties, which latter are very badly watered and often quite dry. 9. The barracks are built of mud bricks, the roofs being thatched with grass to the junction of the verandah roofs, which are tiled. 10. The floors are paved with burnt bricks and raised 4 feet, but there is no passage of air beneath. 11. The materials, used in the construction of barracks, &c., are suitable for the mild climate of Roorkee, but not for any other place. The barracks and cantonments are kept in repair by the executive engineer under the orders of the officer commanding the station. There is often great delay in executing repairs. No one is responsible for the sanitary state of the cantonment. The walls and ceilings of barracks are cleaned and lime-washed once yearly. 12. The men have small tiled sheds for washing houses with a wall on each side, having depressions to hold the washing basins. 13. There are no proper cooking houses; they are mere sheds with places on the ground for the fires. The linen is cleansed and dried by washermen in the fields at a distance from the barracks: quite sufficient for the wants of the station. 14. The privies have seats along the wall on one side with pans under each seat, which are removed by the sweepers from behind outside the building. All filth is carried away morning and evening in filth carts, and flung into the canal, which has a strong current. 15. The privies are open in front with a wall as a screen, and are each provided with a small native lamp. The barracks are very imperfectly lighted at night, by oil lamps in lanterns hung at intervals from the ceilings. These lamps are glass tumblers with coarse cotton wicks floating in the oil. 16. There are no regular drains, trenches being merely cut to carry off the water from the barracks during the heavy rains. The filth is carried away in carts, and no drains are required. The drainage of the privies, &c. is sufficient for conveying away the surface water, &c. the urine being removed in filth carts. No part of any building used as a barrack or hospital is damp. The fluid refuse of the barracks is carried away in tubs, no cesspits being near the barracks or hospital. No foul ditches exist. 17. The surface cleansing of the cantonment is efficiently performed, and the refuse thrown into the canal. 18. The surface of the cantonment is kept free from vegetation, except in private gardens. No old walls, thick hedges, &c., exist to interfere with ventilation. 19. The bazaar is 1½ miles from the barracks, and I have no information as to its state. No nuisance is experienced in barracks from wind blowing over native dwellings. 20. Animals are slaughtered not far from the barracks, but in India where dogs and vultures are watching to clear up instantly all offal, no nuisance is ever experienced. 21. No horses or only a very few ponies are kept in the bazaar; they are tied up in the open air. There is no nuisance experienced from them. 22. There are no artillery or cavalry stables or picketing grounds at this station. 23. There are sufficient quarters for married men; none of them ever live with the men in barracks.
Officers' Quarters.	1. There are no officers' quarters at Roorkee.
IV. Health of the Troops.	1. The station and district together with the native population are healthy. 2. Small-pox is very common and destructive to the natives in the spring when inoculation is practised by them. Cholera occasionally, but not in a very bad form, visits the villages in the district. Spleen disease is rare. 3. The healthiness of the natives in the neighbourhood is to be attributed to the dry sandy soil and mild climate. 4. The regiment stationed here came to Roorkee from Delhi in April last. They had been there since May 1857, and their health was bad and continued so till their arrival here. They left Delhi in March 1860, while there having suffered from the worst forms of dysentery, cholera, and obstinate intermittent fevers, which continued through the cold weather, and were incurable except by leaving Delhi. Abscess of the liver and enlarged spleen were very frequent. No portion of the men's present accommodation is more unhealthy than the rest. 5. Troops are not camped out. 6. I have been in charge of two European regiments in the hills, one at Dugshai, the other in Subathoo; I have also had charge of the sanitarium of Simla. My experience of the effect of a hill climate on troops is very favourable. 7. The 1st and 2nd Bengal Fusiliers came down from the hills to the siege of Delhi in the hot weather and rains of 1857, other regiments joined us from the plains, but no regiment was so healthy as the above two; some of the regiments who had always been in the plains suffered very severely. 8. I much approve of hill stations, and after great experience believe that they save hundreds of lives. Regiments that have suffered from bad climates in the plains have been usually sent to the hills, and their mortality and sickness there has often been great, but this is to be attributed not to the hill climate, but to the diseases which the regiment acquired in the plains, and which it requires a long residence in a good climate to eradicate. Both the 1st and 2nd Bengal Fusiliers went to the hills from Burmah. They had considerable mortality the first year from abscess of the liver and other Burmah diseases, but became very healthy the second year. This mortality on first arrival for the first 12 or 18 months has been the cause of much of the prejudice against the hills, which has increased with the custom of sending to the hills those regiments which have suffered most in unhealthy stations, Burmah, Peshawur, &c., in the plains. I had charge this year of some convalescents (about 15) going to Landour. Among these there were two with abscesses already formed in the liver, and another in the last stage of phthisis; such hopeless cases are too often sent there, and cause a high mortality. My experience is very much against depôts; entire regiments ought to be located in the hills, and not depôts. The machinery of a regiment is formed solely for preserving its order and discipline, and the loss of even one non-commissioned officer must necessarily be followed by corresponding want of order.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	How then can a depôt be properly regulated when the men are collected with scarcely any machinery for preserving discipline, and the men consequently drink and indulge in every kind of excess. If these men were attached to a regiment in the hills they would be subject to its excellent discipline with the rest, and thus have the full benefit of the good climate, which is too often counteracted by hard drinking. 9. Diarrhœa is very common during the rains in hills, but in the two regiments I have not seen one case of death from this cause. The cold weather always removes it, and those who reside always on the hills are not subject to it. New comers only have it. 10. The principal want for the troops in the hills is fresh vegetables and pure water. The men might cultivate their own vegetables if proper arrangements were made; and the drinking water ought to be purified by boiling and filtration. I believe it is the water which causes the diarrhœa. In the rains it is loaded with rotten vegetable matter. I have often prevented my patients from drinking any water but rain water collected in a tub by stretching a sheet on four poles, and always with the result of stopping the diarrhœa. 11. The rains are the worst season in the hills, but even then they are preferable to the plains. The rest of the year, not excepting the winter months, is delightful. Troops, however, can be in the plains in the cold weather, and return to the hills for the hot season. Two years is the shortest period of residence to obtain the full benefit of the hill climate. If a regiment has suffered much from former residence in the plains, I would recommend their remaining for the winter in the hills. A winter in the hills has great effect in restoring men who have suffered from tropical diseases. 12. Regiments have not hitherto been kept more than two years in the hills, which makes them more fit for service in the plains. The effect of long residence there can only be seen among the European inhabitants of Simla and Mussoorie, where those who have lived there for many years appear very robust and healthy, also their children. There are large schools at both Mussoorie and Simla for Europeans, and the health of the boys and girls is excellent. 13. No special precautions are required for troops on leaving hill stations for the plains. 14. The longer regiments can be kept in the hills the better for their health. If the station on the plains is unhealthy, the troops ought to be relieved yearly; if not unhealthy it is much better both for officers and men that they should remain in the same place three or four years, and a great saving of expense to Government. 15. The barrack and hospital accommodation provided at hill stations is sufficient for the health and comfort of the troops. 16. With regard to the elevation above the sea level the most suitable for hill stations, Dugshai, 7,000 feet high, is more healthy than Subathoo, which is only 5,000 feet. I have had charge of regiments in both places. The low ranges of hills are often more deadly than the plains. 7,000 feet I consider to be the best elevation. 17. Mussoorie, about 60 miles from Roorkee, might no doubt be selected as a hill station for a regiment with advantage. 18. Sand with a substratum of gravel I have always noticed to be a healthy class of soil, &c., for stations. Clay, though covered with a surface of sand, although appearing dry and arid, is often very unhealthy. 19. No soldiers ought to be sent to India till they are 21 years old, and have attained their full strength and growth, and they should land in Calcutta in the month of November. There is no uniformity in the mode of disposal of troops after landing in regard to barrack accommodation, as much depends on accident and commanding officers. Strict discipline, and preventing them wandering in the sun into the bazaars in search of liquor, are the precautions necessary to be observed in order to preserve the health of recruits on first landing in India. 20. Troops can be sent direct to India without risk. On landing, a regiment ought never to be kept in Lower Bengal, but sent at once up country to some healthy station, such as Umballa, Meerut, Roorkee, and Sealkote. I would reserve the hills for regiments which have suffered from the climate, though no doubt they would be good intermediate stations for new regiments to acclimate in. 21. There is no uniformity in the mode of transport of troops from the port to the interior. 22. The longer a soldier serves in India the better he is able to do his duty, provided he is not affected by organic disease from previous sickness. The most active and athletic man in my regiment has never been out of India. 23. There is no conflict of opinion in medical boards in reference to invaliding. Numbers of European soldiers are yearly invalided from the Indian local service, who, though not able to serve in India, soon become strong and healthy men in a cold climate. This must be a cause of much unnecessary expense to Government. These men ought not to be invalided, but drafted into a Queen's regiment serving in England, Ireland, or Canada. Many of them, after residing for three or four years in a cold climate, would be able to come back and serve in India. 24. Invalids leaving India for home should depart at such a time in the year as would enable them to arrive in England in the warm weather—not earlier than the 15th of April.
Diseases.	1. There are weekly inspections at the station for the discovery of incipient disease. 2. No case of scorbutus has occurred among the troops at this station. 3. The proportion of cases of hepatic disease is about one per cent. in this station; in others, two and three per cent. Spirit drinking causes a disease of the liver, but it is a contracted liver; pale, and usually called nutmeg colour, never abscesses or enlargements. These in India are always caused by the congestive influence of the malarious poison. Abscesses are often the result of the ulceration of the bowels in dysentery, and are then not single, but many small abscesses scattered through the substance of the organ. Fever and congestion of the liver always form one solitary large abscess. 4. I have never seen a case of dracunculus among Europeans. 5. Syphilis is the bane of the European troops in India. It usually forms one half, sometimes more, of the diseases in hospitals. Unfortunately, the injury caused by it is never brought to the notice of those in authority, and can only be fully appreciated by a surgeon who has been long in the same regiment. Few die of syphilis, but numbers are annually invalided from its effects, and far more die when attacked with other diseases which they would have recovered from, had not their constitution been ruined by this disease. Large sums are spent yearly in vaccination, while this more serious evil remains unchecked. Government

ROORKEE. BENGAL.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	has the power, if it will use it, to eradicate this disease from the army. The cantonment magistrate ought to have women, well paid, under his orders, and their duty should be to inspect constantly all the prostitutes in the bazaar; and the magistrate ought to have full power to fine, and if a recurrence—for a second offence—imprison any woman who diseased a soldier. The soldiers would always willingly point out the woman who diseased them; but in the present state of the law a magistrate has no power to interfere or prevent the same woman from infecting as many as she pleases. When a prostitute is found to be diseased, a proper hospital ought to be provided for her cure. In India the prostitutes are more easily controlled than in any other country. They are not, as in England, outcasts from other classes, but bred and educated for prostitutes, as for any other trade. Women whose trade it is, and whose parents have carried on the same for generations, buy the girls when quite young, and they thus become the bawd's slaves. She feeds and clothes them, and receives all the profits. These bawds are regularly registered by the kotwal, or head man of the bazaar, and are as much under control of the magistrate as a grain seller or cloth merchant. So long as the bawds are not interfered with, it is of course to their interest to allow their girls to cohabit with the soldiers whether diseased or not, as she pockets their earnings; but if she is liable to fine and punishment if she does not withdraw her girls when diseased, she will soon find it her interest to do so. I write the above with the confidence of practical knowledge, for on many occasions my regiment has been encamped at a distance from towns, and where no women could be procured, except from the regimental bazaar, which is under the quartermaster of the regiment and military laws, and through him merely by threatening the bawd with punishment, I have always been able to keep the men free from any fresh infection. Nothing is easier than to detect the girl who causes the infection, for, as before stated, the men will always gladly point her out, but near a town, where the magistrate is controlled by civil regulations for the liberty of the subject, syphilis has always been a most serious evil, and destroys and invalids, if calculated by its after results, more men than cholera. 6. The troops at the station suffer slightly from intermittent and continued fever, but not much from dysentery. No case of cholera has occurred, and only two cases of small-pox were seen last year. Rheumatism, however, is common. The total admissions from all causes have been 711, and from the above five diseases 236, or one-third nearly. The total deaths from all causes have been eight, six of which, or three-fourths, have been caused by the first-mentioned diseases. 7. There are no zymotic diseases in Roorkee except small-pox, which is caused by native inoculators, who practise it in the month of April, at which time the disease is most prevalent. No peculiar condition of station, bazaar, &c., or any personal habits or conditions among the troops, predispose to these diseases. 8. The prevalence of epidemic disease is very little affected, if at all, by the soldiers' duties, occupations, or habits. 9. Small doses of quinine were tried at Delhi, during the siege, as a prophylactic against malarial disease with great benefit. 10. I can suggest nothing towards the mitigation or prevention of malarial disease at Roorkee.
V. INTEMPERANCE.	1. The soldiers at the station, in comparison with other regiments, are temperate, but still there is much disease and crime caused by spirit drinking. There are confirmed drunkards in the regiment, but I have no means of knowing how many. Numbers of men, and even non-commissioned officers, drink hard, without actually getting drunk and coming under the notice of the adjutant. 2. I have no materials to construct a table showing the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station. Drunkenness is always punished as a crime. 3. Distilled spirits are sold both in the canteen and bazaar. The quality is good, but I cannot say the amount consumed. Spirit is no part of the ration at the station, but it is so given on the march and in the field. The quality is good. It is not given before parade, but when the men have arrived, after their march, in camp. All spirit drinking is injurious to health. Spirit is never given as a ration to convalescents. No drinks injurious to health other than intoxicating drinks are sold in the canteen or bazaar. 4. The consumption of spirit is injurious to health, efficiency, and internal discipline. Almost all crime in a regiment is caused by spirit drinking. 5. Spirits ought to be abolished, both from canteens and bazaars within the reach of troops, as far as possible. At present the collectors encourage the sale of spirits as much as they can for the sake of the revenue it produces, but magistrates ought to have full power given them to prevent the sale of liquor to Europeans. 6. Spirits are in every way injurious, while malt liquor is in some cases very beneficial. During my campaign in Burmah I had many opportunies of observing this. When malt liquor could be procured the health of the regiment always improved, and there was a marked change for the worse when spirit rations were issued instead of it. I have good reason for thinking that malt liquor acts as an anti-scorbutic, and corrects the want of vegetables, which could not be procured in Burmah. It is also a very general opinion, and I think with good foundation, that malt liquor in moderation prevents attacks of malarious fevers. Numbers of old residents in India of temperate habits will assert that they were constant subjects of fever till they took a bottle of beer daily. I do not wish to infer that many do not injure themselves by excessive beer drinking in India, but its effects on the constitution *comparatively* with spirits are harmless. Since the introduction of beer into canteens the tremulous, yellow-skinned, emaciated spirit drinker, who is fit for nothing till he has drank his morning dram, is rarely met with. In former days at least one-third of every regiment in India were in this condition, and I state this from personal experience. 7 to 11. Coffee and tea are much used morning and evening by the men, and are very beneficial. A kind of effervescing drink, much like imperial, made with cream of tartar, flavoured with sugar, lemon-peel, and ginger, called "pop," is made in the bazaar, and much drank by the men in hot weather, without injury, and, perhaps, good. Spirit drinking, as before stated, is the cause of at least half the crime in regiments, and it is remarkable that some forms of spirits have the effects of rousing the evil passions of the men more than others. In Cabul this was notorious; spirit is manufactured there from raisins, and the men themselves said that this spirit made them mad. A man of excellent character, in the 13th Light

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	Infantry, who had never before been known to misbehave, went to visit a friend in the city of Cabul, who gave him a glass of the native spirit; on coming home he passed the officers' mess-tents, lighted up for dinner; he fired his musket through the tent, and the ball passed between the legs of the colonel. He said he felt, though not drunk with the spirit, an uncontrollable inclination for mischief, and his plea was admitted as true by the officers on his court-martial, and he was pardoned. I mention this to show, that though drunkenness may continue in a regiment (to be stopped, of course, if possible), yet what a vast difference depends in the crime of a regiment, on the form of liquor which the men get drunk on. Now a man who drinks too much beer gets stupid, sleepy, and plethoric. If he gets drunk on this liquor he goes to bed and sleeps it off, but does not become mad, make a row in the barrack, or wander about seeking some one to fight with. Moreover, beer drinking is easily cured; it never, as spirit drinking, becomes an incurable habit, rarely, if ever, overcome even by educated gentlemen. Our canteen system in regiments formerly educated the men in this habit. It encouraged them in acquiring a liking for spirits by daily issuing it as part of the ration. Spirit rations ought, therefore, totally to cease. No spirit ought to be sold in canteens, but plenty of good beer, as the men will drink spirits if not supplied with beer; also, especially, the sale of native spirits, which are invariably drugged with hemp and other native drugs, ought to be stopped by the Government, where they are vended in the neighbourhood of European regiments, with the most anxious care. Magistrates ought to have full power to punish persons selling liquor to Europeans, and collectors ought to be warned that, though zeal in collecting the revenue is desirable, yet the Government value far more the lives of the European soldiers.
VI. Diet.	1, 2, 3. A pound of bread and a pound of meat is the standard ration, with half a pound of such vegetables as can be procured cheaply in the bazaar. But as there are frequently none there, the soldier has to subsist on lean, tough meat and bread, with tea or coffee morning and evening, without milk. The quantity of animal food is far too great, and a fruitful source of disease in a hot climate, where the men cannot take exercise. I have often heard the men complain that the diet is too strong for them. The diet scale of the navy is far better, and has been proved by large experience to be enough for robust health. The scale there is 31 to 35½ ounces of solid food, and of this only 5 to 9½ ounces are animal, and the remaining 26 ounces, vegetable. How different this is from the 16 ounces of meat that our soldiers live on daily. The Burmah soldiers and sailors were often employed on the same expedition inland, and it was the general remark how much less the sailors suffered from the climate and diseases than the soldiers, though the former were exposed to the climate night and day in open boats, and the latter usually housed, but the sailors carried their ship rations with them, and our soldiers, who receive nothing but lean, tough beef and bread, often looked with longing eyes on the pea-soup and plum-puddings which the sailors cooked, just as if they were on board ship. The result of this diet scale (which is almost perfect, and might easily be introduced for the troops in India, substituting fresh meat for salt) is, that three ships can be now kept afloat with only the same number of men which was formerly required for two. The sailors on this diet are contented and robust; why not, then, the soldiers? Much has been done to improve the diet of the soldier since I have been in India, by the introduction of vegetables, tea, coffee, and sugar. All changes are for the better on the eternal beef and bread of former days, but much still remains to be done. The wonderful effects of good diet on the health of soldiers may be seen by comparing the history of the first Burmese war at Rangoon, with the second in the same place. In the first the army was almost destroyed by sickness caused by bad provisions; in the second war, in the same place, through the same seasons, the troops retained excellent health, because they were liberally supplied with excellent provisions from Calcutta, by the wisdom and foresight of Lord Dalhousie, and it was well known that the soldiers always became sick when they left Rangoon, and could not carry with them into the interior their proper rations. My own regiment lost heavily from sickness on two occasions, when it left Rangoon on service towards Pegu, and there was no cause that I could discover for the change but the inferior provisions. Potatoes, with a little care, can be kept all the year round, and officers always have them. A little trouble is required in the rains, when they rot if not kept dry; but this trouble ought to be given and potatoes supplied to the troops the year round. The rations are inspected every day by the quartermaster and officer of the day. 4. The cooking apparatus is sufficient, but the cooks ought to be better paid, and taught a little of the art of cooking. The kitchens are mere sheds, and not as good as they ought to be. The food is mostly boiled, for the meat is so tough and lean that if roasted it is so hard that it cannot be eaten. The only way a soldier can make his meat eatable is by stewing it till it becomes softened. The tea and coffee are good, but a little milk, which can be procured very cheaply in India, ought to be allowed for them. The men usually have coffee half way on a march. 5. Vegetable gardens ought to be established in every European station, not to be cultivated by the soldiers but by natives, under the commissariat officer. European soldiers cannot, in the hot weather, work as labourers. In the cold weather even the sun is too hot for them to work during the day, and their mornings and evenings are occupied in drill. I have seen many attempts to persuade the soldiers to work in gardens, but they have all failed. A good vegetable garden, however, worked by natives, under the commissariat, would be invaluable and save expense to Government, as the cost of a garden worked by natives is very trifling, and the produce large.
VII. Dress, Accoutrements, and Duties.	1. On the subject of dress I have, I think, valuable information to communicate, viz., how to waterproof the men's clothes, boots, and bedding; the rest I must omit from want of space. In Burmah, but especially during the siege of Delhi, in the rainy season, I was much struck with the suffering of the men from wet clothes. The constant history of the most severe cases of fever and dysentery on admission into hospital was, "I was quite well, sir, till I "got wet, and was obliged to lie in my wet clothes all night on picket." A large proportion of these cases, of both officers and men, terminate fatally. It was the same in the Crimea; numbers of officers who were there have told me it was not the cold, it was not the heat they cared about, or which hurt them, but it was the wet, and being obliged to remain in their wet clothes without the possibility of changing them. Since the Delhi siege I have occupied my leisure in trying carefully every receipt I could find for waterproofing cloth and leather in the old as well as the most recent works, particularly the *Mechanics' Magazine*. I have

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*cont.*	tried several hundred receipts, some good, others entire failures, and after repeated experiments, I can recommend the following, as scarcely admitting of improvement, either in cheapness, simplicity, or thorough waterproofing power. 1. *For Woollen Cloth.*—Burnt alum and sugar of lead, of each 4 oz. to be dissolved in two gallons of rain water for 24 hours, and kept stirred occasionally. Then drain it off once or twice till clear; put the cloth in and let it soak 48 hours. Then take it out and wash the cloth in repeated changes of fresh water, till the water it is washed in becomes quite clear, and free from alum. Do not during the process squeeze or forcibly rinse the cloth. When the alum is thoroughly washed out, then hang it up to dry, but not before a fire, or in the hot sun. This receipt was invented in Paris, and is very valuable, as the colour and appearance of the cloth remain unaltered. I have a cloak thus prepared which I have frequently put across a chair, and poured water in a small pool on part of it, and allowed it to remain for 24 and 36 hours without a drop or even damp passing through, and yet no one on examining the cloth could detect any difference in it from common blue cloth. The wool seems to absorb and chemically combine with the solution. The latter part of the process, viz., thoroughly washing the cloth in clear cold water till all remains of alum not absorbed is dissolved away is a very essential part of the process. I always failed till I learnt this, but if my receipt is followed accurately it will be found very simple and easy. 2. *Boots and Shoes.*—To waterproof leather, take of linseed oil 16 oz., mutton suet 8 oz., white beeswax 6 oz., resin 4 oz., and melt them together over a slow fire. Rub the boots well with this ointment, also rub it carefully into the soles and seams, and put them out of doors in the hot sun. In a cold climate this must be done before a fire, and the heat must be sufficient to keep the ointment soft, so that it may soak through the leather, and appear on the inside. This is readily done in India in about three hours, by exposing the boots to the sun and applying fresh ointment as it soaks in. The commonest leather treated in this way becomes waterproof, and very durable. I have boots thus prepared, of which the upper leather appears never likely to wear out, though I have worn them for a long time in constant walking. I also, as an additional protection to the sole from wearing and wet, soak them in one part of resin dissolved in eight parts of turpentine. This makes the soles, if it be repeated once or twice, as hard and durable as stone. The application ought to be renewed after walking in the boots for three weeks or a month, and well soaked in, but this resin and turpentine must not be put on the upper leathers, or they become too hard to be comfortable. This resin and turpentine will make the seams, called the welt, where the sole is sewn to the upper leather, quite waterproof, even in badly sewn native shoes. The ointment soaked into the upper leather makes it soft and pleasant to wear. The leather never cracks, and appears to me to last a very long time. This once done, never requires renewal; the leather is saturated and continues so. It may be thought that any grease, and that many proportions of resin, oil, &c., will do as well, but it is not so. I have tried, I believe, almost every receipt ever published, by the infallible tests of taking pieces of common native leather, soaking them in the preparations from different receipts, and then putting a pool of water over them over a tumbler, and trying how long the water remained on the surface without running through and damping the under surface of the leather. Fat and oil thus tried let the water through the leather in half an hour, and I find all the receipts thus tested inferior to the above, and No. 3, which I will give below. Both these are perfectly watertight, and will hold water for 24 hours, and probably much longer, for that was my limit of trial. I obtained No. 2 from a Canadian traveller, who tells me the settlers use it there, and that it keeps out even snow. There is one disadvantage in applying the above receipt to shoes, that they will not polish when blacked for some 14 days after they have been thus treated. After this time, if worn constantly they will gradually take the blacking. A strict adjutant might object to dull boots on parade, and officers especially dislike their own boots to be so. The following receipt is free from this objection, and boots saturated with it will, if dried for two days in the sun, take a more brilliant polish than before. No. 3.—Drying oil, two pints, india-rubber 1 oz. Cut the india-rubber into small shreds, and dissolve it by boiling the oil on a moderate fire, then strain after all is dissolved. The drying oil can be obtained from any house painter, as it is the basis of their paints, or it may be made at home very easily thus :— Pure linseed oil - - - 1 pint. Litharge - - - 1½ oz. Boil for three hours, stirring it well, then take it off the fire and put it aside to settle for 2 days, pouring off the clear oil for use. All the materials for the above three receipts can be obtained in the native bazaars very cheaply, and the quantity required to soak the leather and cloth is not much. No. 3 is even more waterproof than No. 2, and will render, for I have tried it, even a piece of white kid glove water-tight, and it makes the leather take a better polish than without it. No. 3 is also an excellent waterproof for cotton cloth and common fine calico, such as is used for shirts. In the rains when it is hot and cloth clothing oppressive, the soldier might be provided with waterproof calico blouse leggings and cap cover, which with waterproof boots would render him impervious to rain. This calico clothing will roll up into a bundle half the size of a knapsack, which the soldier can carry with him and put on over his other clothing when exposed to rain. No. 3 dyes the cloth a red brown colour, and looks well. Calico steeped in it dries in the Indian sun in 12 hours, and the calico remains flexible, as before, without stickiness, and is very waterproof. The soldier's bedding is at present entirely unprotected from rain when on a march or moving even to their guards. They ought all to have a calico cloth to wrap it in, waterproofed by No. 3. I always use myself on a march a common sheet dipped in No. 3 to tie up my bedding in. It has often struck me as wonderful, that in these days of chemistry and improvement nothing has yet been done to protect the soldiers from wet, and that they are still sent on service in shoes, which do not resist wet much better than brown paper, and with their clothes and bedding liable to be soaked by every passing shower. Even on a common relief march I have often seen the unfortunate soldier, if it rains for a few days, with wet clothes and wet bedding, which he is unable to change until the sun again shines. In London we provide waterproof covering for our hack horses, and yet in India our soldiers are entirely unprotected. The woollen cloth would be better waterproofed in Calcutta before it is made up, and hung up in open sheds in the shade to dry. After steeping, the cloth might be conveniently washed in the running water of the river, and hung upon the sheds, without

References to Subjects and Queries.	Replies.
	squeezing or forcible wringing, to dry. The expense of drying is less in Calcutta than in England. Cloth thus waterproofed is not in any way altered in appearance, durability, or colour. I have a cloak thus prepared, and which, as I have before stated, resisted the action of water for from 24 to 36 hours. For boots and shoes and calico clothing the waterproofing material ought to be supplied by Government to quartermasters, and the men taught to apply it themselves. I trust that the Commission will not think that I have given too much space to these details, as I may call them, of domestic economy in a regiment. Any statistics I could give for the few months (seven) we have been in Roorkee could be of little value, and the barracks, hospital, and other buildings are little better than sheds, which were run up by order of Lord Clyde during the mutiny, for the temporary shelter of the regiment forming part of his Oude army. Their measure therefore can be of no value as a model for other places, for out of Roorkee, with its mild climate, they would not be habitable. But I have been many years in charge of European regiments in many a battle, and many unhealthy climates from Cabool to Burmah, and have seen more service with them than perhaps any other medical officer in India, and I am convinced that should I be so fortunate as to attract by these remarks the attention of the Commission to these important points, the benefit resulting to the soldier will be very great, far more indeed than any one can even imagine who has not lived so long with them as I have done.
VIII. Instruction and Recreation. IX. Military Prisons. X. Field Service. XI. Statistics of Sickness and Mortality.	No information under these heads.
XII. Hospitals.	1 to 5. The hospital is one of the 21 barracks, and exactly the same in dimensions, &c. 6. The ventilation is effected by holes in the roof thatched over; and these means are sufficient. There are no jalousies or jhilmils. 7, 8. There are no means of cooling or warming the wards artificially. The walls and ceilings are whitewashed yearly. 9. The privy is a shed outside the building, where the men also make water. Those who cannot walk can use copper pans, which are provided for the purpose. Both these and the privy are cleaned by sweepers with lime and charcoal, and they are not offensive, though not supplied with water. 10, 11. A small shed is used as a washhouse for the sick, which is sufficient. A bathing tub and foot bath are also provided, which are also sufficient. 12. The washermen carry the hospital linen to a distance, where it is washed and dried. 13. The storage is sufficient and dry. 14. The cots in the hospital are wooden with white tape wove for the centre. They would be better made of iron, as the wooden ones harbour bugs in the joints. 15. The kitchen is simply a hut, and the cooks prepare the food on the ground. This arrangement is not good; but we are accustomed to it in India. The hospital diet is, I think, sufficient. 16. No reply to this query. 17. The attendance on the sick is not sufficient. Healthy men are detached for this duty from the barracks; but they dislike it, and often neglect their patients. 18. In Roorkee the sanitary condition of the hospital is good. The doors are kept open day and night, and no epidemic has occurred. 19. The attendance on the sick ought to be improved, as it is now very deficient. 20. Convalescents take a walk morning and evening, and a few ride on two elephants, which are sent daily for their use by the commissariat. A few extra doolies would be a great benefit for those who are not able to walk or ride on the elephants. 21. A hospital is provided for the sick wives and children of the soldiers, with two native female attendants. The present arrangements are sufficient. The women nurse each other, and they are better off in this respect than the men. 22. There are no special hospital regulations not included in the general presidency medical regulations. 23. The medical officer has no power in matters appertaining to the sanitary state of the hospital, &c., and his advice is seldom attended to, except he be the personal friend of the commanding officer. 24. No convalescent wards or hospitals exist, and I do not think they would be advantageous. A patient when well enough returns to his company, and is there under the usual discipline, is inspected daily by the surgeon, and when recovered returns to duty. It would be very difficult to keep up discipline in a separate convalescent barrack, as the men would get liquor and wander out of bounds.
XIII. Burial of the Dead.	1, 2. The British burial-ground is a mile distant from the station, to the south-west, and the prevailing wind does not blow over it. The soil consists of dry sand, and the ground is carefully kept. 3. There are no regulations as to grave space; but the graves are generally 10 feet deep, and are never re-opened. Interment takes place at ordinary times, and during epidemics within a few hours, rarely more than 12, after death. 4. The graveyard is never offensive. The regulations as to the burial of British troops are the same as in England. 5, 6, 7. Camp followers and bazaar people burn or bury their dead according to caste. No injury accrues to public health from the present practice, nor are any improvements in the disposal of the dead to be suggested.

18th November 1860.

(Signed) E. Hare, Surgeon Major,
2nd Bengal Fusiliers.

PUNJAB.—UMRITSIR AND GOBINDGURH. BENGAL.

PUNJAB.—UMRITSIR AND GOBINDGURH.

Accommodation { Queen's Troops { Artillery - - 120 / Infantry - - 500 } / Native Troops Infantry - - 300 }

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is richly cultivated, flat, dry, and in parts sandy, with no wood, jungle, or water in the vicinity.
	2. The station is elevated, is between 800 and 900 feet above the sea, but it is on a level with the adjacent country. There is no higher or healthier ground in the vicinity of the station.
	3. The low range of hills beyond Pathan Kôte, in the neighbourhood of Noorpore, is about 62 miles distant from the station, and is about 1,200 feet above its level.
	4. The branches of the Huslee Canal skirt the cantonments, and one branch leads directly into the gardens and grounds belonging to Rajah Tej-Sing, which are situated within the cantonment pillars, or rather ought to have been within cantonment limits. At times the cantonment is partially inundated during the rainy months, namely, July and August, but the inundation seldom lasts beyond 48 hours, and at all other seasons the drainage carries off the rain-fall very readily. I have only seen the cantonment under water once during a residence of upwards of three years, and then the rain was very heavy, and continued with scarcely any intermission for seven days. There are no ravines, water-pits, or broken ground near the station.
	5. The station is open, and freely exposed to the prevailing winds. The walls and hedges of cantonments, by a recent order of the late C. C. General Anson, are never permitted to exceed four feet. The houses and bungalows have been built with considerable intervals between, a compound being attached to each. The barracks are also well situated, so as to leave free space for external ventilation. The internal ventilation is also good, as, in addition to a free circulation of air below, a range of upper windows on both sides is provided. The temperature of the station is not raised by exposure to reflected sun heat. The prevailing winds blow about north-west and south-east; those from the north and west are commonly designated the hot winds during the months of April, May, and June, and prevail generally, with occasional intervals, the whole year. The south-east winds prevail in the rainy months, namely, July, August, September, and part of October. The north-west winds are healthy, even when the heat is excessive, and this can be easily accounted for by the air being so dry and free from moisture. The south-east winds are loaded with moisture, and when they begin to blow, towards the end of June, are indications of the rainy season, and certainly act, from this cause alone, on the general health, as well as being the medium through which malaria is conveyed into the lines, intermittent fevers making their appearance shortly after the setting in of these winds.
	6. The surrounding country is in a high state of cultivation, but there are no works of irrigation near the station. Rice is not grown within a distance of 50 or 60 miles of cantonment limits, neither is indigo cultivated near the station. There are a few fields of flax, however, within three-quarters of a mile of cantonments, but so very small that no injury or nuisance can result from its cultivation.
	7. About a mile and a half from cantonments, and in a direct line with them, is the largest city in the Punjab, containing a population of 120,000 souls.
	8. The surface soil is composed principally of clay, mixed with a small proportion of sand, which hardens and splits, leaving small fissures in every direction, except when the ground is prepared for cultivation. The subsoil is composed of clay to a depth of four or five feet, terminating upon kunkur beds. The station occupies new ground.
	9. Water is usually found during the dry season at a depth of 36 feet, and there is a difference, I believe, of four feet during the rains.
	10. The rain-fall and water from surface springs flow readily away, except during unusually heavy rains. The water generally drains off without sinking through a pervious subsoil, that which is left being carried off rapidly by evaporation. No drainage from higher ground passes into the subsoil of the station.
	11. The water supplying the station is derived from wells; there are no tanks. The wells are kept remarkably clear from matter falling into them, no foul drainage or impurities being allowed to pass into them.
	12. I am unable to state the amount of water supply further than this,—that each compound is provided with an excellent well, and the barracks and hospital each with a large well. The water is colourless, and without taste or smell; but I am unable to state its chemical composition, though there may be a small trace of nitrate of potash, as some of the wells in the neighbourhood are impregnated with this substance. I look upon the water as holding an intermediate character between hardness and softness, being well adapted for all purposes. The water is very good, and the supply is ample; it is drawn by means of large leathern bags, and no better supply could be obtained.
	13. I consider the two gardens belonging to Rajah Tej-Sing as very objectionable. One is situated close to the officers' quarters, surrounded by a high wall, thickly studded with trees, and is frequently submerged by the water of the Huslee Canal; it is, or rather ought to be, within the cantonment pillars. The other garden is situated on the right flank of the station, is thickly studded with orange trees, also surrounded by a high wall, and the surface of the soil is constantly submerged by the water of the canal. I consider them both nest-beds of fever during the rainy season.
	14. Sites of stations, both on the hills and plains, are selected, I believe, rather on political and strategical grounds than with reference to their topography, climate, diseases, or sanitary conditions, troops being generally cantoned in the neighbourhood of large cities. When a

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	committee does select a site, two medical officers are generally members. Before permanently selecting a station for troops, either on the hills or plains, I would suggest that two experienced officers—one a military engineer and the other a medical officer—should occupy the ground, whenever practicable, for a period of 12 months, in order to draw up an elaborate report upon everything connected with the site; that they should be provided with instruments necessary for the investigations; and that the medical officer should send in to Government at the same time a report of the various diseases incidental to the region, their frequency or non-frequency amongst the natives, their likelihood or not to attack the European soldiery, means of prevention, &c., as well as everything that will bear directly or indirectly on the well-being of the European soldier.
II. Climate.	1. The only instruments at this station for conducting meteorological observations are a thermometer and a rain gauge. 2. Table of meteorological observations.

Three Years of Observation, from 1st January 1857 to 31st December 1859.

Months.	Barometer mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain. Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Dew, Wind, Storms, &c.
		°	°	°	°				Ft. in.				
January	No instruments.	54	—	61	47	No instrument.	No instrument.	76	0 1·10	East to West	Moderate.	Not particularly observed. The months of June, July, Sept., and Dec., frequently cloudy. The others clear, with occasional clouds.	Very cold, but cloudy weather; rain.
February		60	—	66	54			78	0 2·0	Westerly	Calm.		Clear and calm; occasional showers.
March		68	—	76	60			94	0 0·70	Do.	High winds.		Clear and dry weather.
April		81	—	83	71			98	0 5·20	Easterly	Gales.		Clear and cloudy; damp.
May		86	—	89	82			109	0 1·20	Do. and Westerly.	Storm,—hurricane.		Clear, dry, and hot; month of storms.
June		87	—	92	86			106	0 8·40	Easterly	Storm.		Damp, cloudy weather.
July		87	—	89	85			102	1 10·70	Do.	Monsoon.		Cloudy, and rainy weather.
August		88	—	88	84			109	0 10·50	Do.	Moderate.		Sultry, uncertain weather.
September		84	—	86	80			108	0 4·20	Chiefly W.	Do.		Cloudy; weather uncertain.
October		76	—	84	67			101	—	Westerly	Calm & Mod.		Cool, pleasant month.
November		61	—	72	51			90	—	Do.	Moderate.		Bracing weather; cloudy.
December		55	—	65	44			77	0 0·60	Do.	Do.		Very cold uncertain weather.

3. The climate of this station, comparatively speaking, is very healthy. The dryness is remarkable for many months in the year, but heavy falls of rain occur during July, August, or September, constituting what is technically called the rains. During the cold season, about the end of December or beginning of January, some heavy showers of rain generally occur, but cannot always be reckoned on. The heat during the hot months, from about the 15th of April to the beginning of October, is intense. During the cold months there is considerable variability of temperature, especially after a shower of rain, when the thermometer sometimes falls to the freezing point, after having stood steadily at 15° and 18° above it previous to the rain. The cold is severe in the winter months, ice forming readily at night in December, January, and the early part of February, a sufficient quantity being obtainable then, as a general rule, to supply the residents and hospitals during the six hot months of the year. Fogs are very rare, and the damp never appreciable except after heavy rain; when they do occur, it is generally at the end of the hot and cold seasons. When the hot winds blow, the air is loaded with fine particles of dust, and during the dust-storms, which prevail from time to time in April, May, and June, the air becomes densely loaded, and at mid-day, during a dust-storm, a candle is often necessary in order to enable one to carry on his ordinary avocation. The air is not loaded with any other admixture or impurities; no irrigation or tree planting influencing the climate generally. The cold season, after it fairly sets in, and the hot winds are not unhealthy, provided that in the hot winds the men are not exposed, but kept under shelter. The hospitals begin to fill after the first fall of rain, and the season goes on increasing in unhealthiness until the cold weather begins to brace up the men. The diet should be light and nourishing during the hot months; animal food admissible but once a day; all alcoholic drinks should be avoided, and no malt liquor served out in the heat of the day; the clothing as light as possible, each man being obliged, however, to wear a thin flannel jacket next his skin, which ought to descend low enough to protect his abdominal viscera. All men who have suffered from dysentery or hepatic affections ought to wear flannel binders, and this, I think, should be compulsory, as it is undoubtedly one of the greatest safeguards against either of these affections. Collars should be worn low and loose in summer and winter, but stocks never; and everything tending to interfere with the free circulation of the vessels about the neck should be removed. I would recommend the wearing of light wicker helmets, both in summer and winter, as the sun is at all times powerful. Drills and exercises of every kind ought to be reduced to a minimum in the hot months, especially in June, and should cease almost immediately after sunrise, with only a roll-call in the evening. In the cold months the men should have warm clothing, good nourishing diet, meat twice a day, and drills and exercises at the discretion of the commanding officer. Dram drinking I condemn at all seasons. The barracks ought to be lofty, well ventilated, and each man ought to have at least 1,800 cubic feet of space. In the hot winds tatties should be used. December and January are the two healthiest months.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	in the year; next after them February, March, and November; then April, May, and June; more unhealthy still, July and August; and the two most unhealthy September and October. During the unhealthy months, continued and intermittent fevers, diarrhœa, dysentery (acute and chronic), hepatic affections, and occasionally epidemic Asiatic cholera, prevail. In June and July, solar apoplexy is most apt to occur. 4. There is no district near the cantonment with a climate more conducive to health than that of this station. 5. I have visited the hill stations of Landour, Mussoorie, and Dhurmsala, but have only served at Calcutta, Meerut, and Umritsir and Govindghur. Of Calcutta I am unable to speak, having remained there but some 14 days. Meerut is a very favourite station, but not so healthy as the Punjab. In 1854 the artillery recruits suffered severely from "*coup de soleil*," the 81st Queen's still more. Dysentery and hepatic affections prevail with much greater intensity there than here; the fevers are developed in the rains with greater intensity, being frequently accompanied by violent purging and incessant vomiting. The falls of rain are much heavier, the cantonment not so well drained, and the water lies for days between the barracks and on the parade ground. Govindghur is the large fortress situated about one mile from the cantonment, and erected by the Sikh powers to overawe the city. It is tolerably healthy, although the ventilation is imperfect within the walls, and, I think, will bear comparison with most stations. Amritsar was not occupied by European troops before 1857. The official year, which has just closed, shows the mortality in the artillery division (composed of two European companies) under one per cent., which, I think, will bear comparison with any station in the presidency.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Plans of the station, surrounding country, and barracks are transmitted. 4. Date of construction of barracks, 1st April 1859. Total number of rooms in each, 15. Total regulation number of non-commissioned officers and men, 110 for each barrack. [No table of accommodation has been filled up.] 5. The windows of the barracks are on opposite sides, and open by means of a rope and pulley. There are verandahs all round the building, generally about 10 feet wide and 12 feet high. These are sometimes occupied as sleeping quarters by native servants, but very seldom by soldiers. Chicks and purdahs are employed instead of jalousies and jhilmils. 6. Bedsteads of dyar, and broad tapes stretched across for sacking, are generally in use in the barracks; but I would suggest iron bedsteads, with thin iron laid across in strips, fitting into studs, as far the best. 7. The tent in use in cantonments, is that called European Private N.P. It is a double pole tent, with a double fly, single walls, 6 feet high; 22 feet by 14 feet, and constructed to accommodate 16 men each. Several methods of ventilation exist in the barracks, tents, &c. An open ventilator along the ridge of roof is common, as also skylights fitted with windows to open and shut; but I think this latter arrangement insufficient for the purpose. The air of barrack rooms is cooled,—1st. By means of punkahs, that exert a refreshing influence, but do not lower the height of the thermometer. They cost about 8 annas (one shilling sterling) per superficial foot; 2nd. By means of tatties and thermantidotes, which really lower the temperature. The latter apparatus costs about 50 or 60 rupees, and about five are required for each barrack. 9. Some of the permanent barracks are constructed of bricks and mortar, some of brick and mud, while the temporary are of unburnt bricks and mud. 10. The floors are composed of brick and mortar, fine masonry, and are raised about two feet from the ground. Ventilation under the floors exists only in two-story barracks, of which there are none at this station. 11. The materials of which the barracks, tents, &c. are constructed are the best that I could suggest; but I would point out that if hollow bricks were employed the barracks would not retain the heat so long after sunset; at present the walls are very hot six or seven hours after the sun has gone down. The barracks and cantonments are kept in repair by the executive engineer of the station, and the officer of the quartermaster-general's department is responsible for their general sanitary state. The walls and ceilings of the barracks are cleansed and lime-washed once a year, or oftener if required. 12. The men's lavatory consists of an oblong building, with a masonry stand in its centre, upon which are placed earthen jars and basins of water. 13. The cookhouses are square rooms with native chulahs or fireplaces, and are of no particular design, beyond four walls and a roof. Dhobies, or native washermen, wash and dry the linen in their own way. 14. No reply. 15. Privies, cookhouses, and lavatory are lighted and ventilated by openings at the top of the walls, and the barracks are lighted at night by oil-lamps. 16. No drainage is required for barracks, as all filth is removed by conservancy carts, and the natural drainage is sufficient to carry away all surface water. I believe no dampness exists in the buildings at this station. The fluid refuse of the barracks, if not removed by conservancy carts, evaporates. There are no cesspits of any consequence that I am aware of, and the distance of those which do exist, from the nearest men's quarters, and from the hospital, varies from 30 to 50 yards. The Umritsir city ditch is about 1½ miles from the station, and to leeward of it. 17. All filth is daily removed, or ought to be, from the surface of the cantonment, and its vicinity. 18. The surface of the cantonment is kept as free as is necessary from vegetation, and no complaints have been made on this head. I am not aware that any old walls, thick hedges, &c., exist to interfere with the free ventilation of the station or bazaar, &c. 19. The bazaar is in the charge of the station staff officer, and, I believe, is tolerably clean for a native bazaar. The quartermasters of regiments superintend the bazaars, and sweepers and water carriers are employed to keep them clean. I cannot suggest any improvement. The condition of the native houses near the station is good. They are small, and suitable to the natives, and no dunghills or cesspits are allowed within them. The barracks being situated to windward of all native dwellings, no nuisance is experienced from wind blowing over the latter.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	20. Animals for the use of the soldiers are slaughtered about one mile from the barracks. 21. There are no bazaar horses. 22. Cavalry horses are kept in open stables, not in a building at all. The litter is removed daily, either for fuel, or for spreading in the riding school. The stables do not appear to act injuriously on the men, nor are they offensive in the barracks. The picketing grounds are arranged in rows, generally by troops in cavalry, and divisions in artillery. The distance of these grounds from the men's accommodation and the hospital is variable. 23. There are no barracks at present for married non-commissioned officers or men, the married men of the 2nd company, 1st battalion, Bengal artillery being in the same barrack with the unmarried men of the company, as well as some men of the 51st Queen's, a purdah, or cloth, being the only separation between them.
Officers' Quarters.	1. The officers occupy detached bungalows, which are their private property. The sanitary condition of these quarters is good, as are also their drainage and ventilation. I would suggest the purchase of bungalows by Government. No officer on leaving a station likes to leave his house unsold, and very often will not rent it to the officers of the relieving corps, and the consequence is great inconvenience, as many officers have not the means of purchasing; this is the case here with the 51st Queen's. The officers are crowded together because they decline purchasing, and the owners belonging to a corps which has left the station having been obliged to purchase, decline renting. Many of the houses here are, therefore, unoccupied and empty.
IV. Health of the Troops.	1. The station, surrounding district, and adjoining native population are generally healthy. 2. Small-pox, chicken-pox, measles, cholera, and intermittent fevers are the diseases most prevalent amongst the natives. Spleen diseases rare. 3. I attribute the prevalence of the above diseases to the utter ignoring of all sanitary arrangements in the city, and, in the country, to the dirty habits of the population, the close, overcrowded, ill-ventilated buildings in which they live, and, in the rainy season, to sleeping outside exposed to the night air loaded with moisture and malaria. 4. The 2nd company, 1st battalion, Bengal artillery were in Jullundur from 2nd November 1851 to 15th October 1853, when they left for this station, where they arrived on the 19th October 1853. The state of their health at Jullundur was good, the diseases from which they suffered being principally dysenteries and fevers. They were in good health on arrival here, and have since suffered from continued and intermittent fevers, dysenteric and hepatic affections. The 2nd company, 2nd battalion, Bengal artillery were at Phillour from 5th July 1857 to 8th April 1859, when they left that station for this, and arrived here on the 17th April 1859, in good health. The diseases from which they suffered were dysenteric and hepatic complaints and fevers, but on the whole the state of their health was good. They have suffered since arriving here from hepatitis, dysentery, and fevers. The left wing of H.M. 51st Light Infantry were at Mean-Meer from 6th December 1858 to 5th January 1859; they left on the 6th January 1859, and arrived here on the 8th of the same month. The state of health of the men at Mean-Meer was good, the principal diseases being continued and intermittent fevers. They were in good health on their arrival here on the 8th, and have since suffered from fevers, bowel complaints, and "coup de soleil." The left wing of the extra Goorkha regiment were at Philebut from September 1859 to 26th January 1860, when they left for this station, and arrived here 17th March 1860. They were in good health at Philebut, where the principal diseases were fevers and dysenteries. They were in indifferent health on arriving at this station, and have since suffered severely from continued and intermittent fevers, with a few isolated cases of dysentery and small-pox. The gun lascars of the two companies of artillery have been remarkably healthy, both at their former stations and here, and the same may be said of the Ordnance drivers of No. 16 Light Field Battery, to which the 2nd company, 1st battalion, is attached. The principal diseases at both stations have been diarrhœa and intermittent fevers. The gun lascars always move with their respective companies. The old hospital of 43rd Native Light Infantry is now used as a barrack for European troops. I attribute the greater unhealthiness of this building to its narrowness, want of ventilation, no outer verandah, and increased heat from the roof being covered in with tiles. 5. The troops at this station have never been camped out, with the exception of the 2nd company, 1st battalion, Bengal artillery, during the epidemic cholera in 1856, for a few weeks, and then they derived little or no benefit from the change. 6. I have never been in charge of troops at hill stations. 7. I have observed that the convalescents on rejoining from hill stations are less liable to febrile diseases on returning to the plains. The change from a relaxing to a bracing climate, and the complete absence of malaria in the hills, enables the constitution to recover itself before being again exposed to its influence. From other diseases little or no benefit is derived by a residence in the hills. 8. I approve of hill stations for troops. 9. Chest affections, diarrhœa, and dysentery are the diseases peculiar to hill stations, and by which troops are liable to be attacked on going to them. 10. At hill stations, during the rains, I would suggest greater precautions with reference to dry warm clothing, especially guarding against the men being allowed to remain in the barracks with their feet wet after duty; any men liable to or suffering from hepatic and dysenteric affections to wear flannel binders. The diet, shelter, duties, and exercises, as far as I am able to judge, are good at hill stations. 11. From the beginning of April to the middle of November is the period best adapted for a residence in the hills, and in order to confer benefit on the troops, such residence should last at least one year. 12. There is no period of residence in the hills beyond which injury is likely to be inflicted on the health of the troops on their return to service in the plains. 13. No special precautions are necessary for protecting the health of troops on leaving the hill stations for the plains. 14. I consider it to be conducive to the health of troops to locate them on the hills with short periods of service on the plains. Frequent change of station in the plains is, I think, objectionable both to troops and convalescents.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—cont.	15. Both the barrack and hospital accommodation at hill stations are tolerably good, and I am not acquainted with any deficiencies in the accommodation of the hill stations which I have visited. 16. I would recommend no hill station under 6,000 or above 8,000 feet above the level of the sea. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. I cannot say what particular classes of surface and subsoils are more healthy or unhealthy for stations than others. 19. Soldiers should not be sent to India under 19 or 20 years of age, nor above 30, and they should land in this country at the commencement of the cold season. For preserving the health of troops on first landing in India, I recommend the duty to be as light as possible, clothing light, and easy, guarding against exposure, total abstinence from spirits, and a reduced allowance of malt liquor, with tea, coffee, or cocoa as a substitute. The head to be well protected from the sun by a light wicker helmet, and every man to wear flannel, sufficient to protect his chest and abdomen. 20. I think it would be better always to send the men to an intermediate station for a certain time before despatching them to India. If they have served at such intermediate station, I should consider them fit for duty on the plains on landing, but if not a short sojourn on the hills would be preferable before encountering an Indian climate. 21. Troops are transported from the port to the interior in country boats or river steamers, when water carriage is available; when proceeding by land, marches from 10 to 14 miles per day, with occasional halts, is the mode adopted. I do not consider any additional precautions necessary on the line of route. 22. I consider that a British soldier should serve in India not more than 17 years. 23. A conflict of opinion does, I believe, sometimes on medical boards occur as regards invaliding, as the invaliding committees at the presidency have the power of reversing the opinions of the standing medical committees. I would suggest that the opinion of the station invaliding committee be final (as it is composed always of five experienced medical officers), and would lessen the duties of the medical officers at the presidency, who have almost always more work on their hands than they can possibly get through, and who would, I am sure, consider it a great boon to be relieved of these duties. 24. Invalids should leave India for home during the months of January and February.
Diseases.	1. In the Bengal artillery regular inspection parades every Monday morning at sunrise are only ordered when men suffering from venereal diseases neglect reporting themselves at hospitals immediately after being affected. There is an inspection parade of H.M.'s 51st regiment every Monday morning at 10 a.m.; such parades are never ordered for native troops. 2. No case of scorbutus has occurred among the troops of Her Majesty's Indian forces at this station. 3. The proportion of cases of hepatitis to all other diseases is 4·66 yearly, and this is to be attributed to intemperance and dysentery. It is not generally the consequence of other diseases, but when complicated with dysentery, hepatic disease is, as a general rule, secondary. The complete withdrawal from canteens of the spirit ration would, in my opinion, be the best prophylactic measure against this disease. 4. No case of dracunculus has occurred here, either in my European or the native hospitals. 5. The proportion which the constantly sick from venereal diseases bear to the total sick in hospital from all other diseases is 0·07 to 1. I would suggest that a larger proportion of non-commissioned officers and men be permitted to marry. I do not think that the establishment of lock hospitals would be advantageous to the health of the army. 6. The following are the diseases from which the troops at this station suffer, viz.:— *Fevers.*—Continued fevers in April and May, but not usual. Quotidian intermittent fever is very common at all seasons, but tertian intermittent is seen only from time to time; quartan very uncommon. *Dysentery.*—Acute, sub-acute, and chronic. *Cholera.*—The men suffered slightly from this disease in the epidemic of 1856, and more severely in 1857, but there has been no case since. *Small-pox.*—The modified, distinct, coherent, and confluent, in fact every form of this disease. *Rheumatism.*—Rarely idiopathic, generally complicated with syphilis and gonorrhœa. The proportion which admissions from the above diseases bear to the total admissions is 0·40 to 1; that of deaths to total deaths, 0·44 to 1. 7. The nosological character of the diseases is sharp, clear, and well defined. These diseases are most prevalent in the winter, spring, and summer, increasing in virulence during the hot winds, but the number of cases decreasing; generally disappearing after the first heavy fall of rain at the end of June or beginning of July; unusual dryness of the atmosphere generally precedes or accompanies their appearance. There are only a few isolated cases among the European soldiery at this station, and these almost always arise from the men entering the city without leave, and coming in contact with those who have suffered and are suffering from these diseases. I mention this because the sanitary condition of the barracks is good. The bazaar is carefully looked after, but the native dwellings in it are very defective as regards cleanliness and ventilation, and are overcrowded. The drainage and water supply are good. The personal habits of the European troops do not predispose them to these diseases, and the native troops are cleanly in their habits, but from living in close, over-crowded, and ill-ventilated dwellings, are certainly more predisposed to these diseases than they otherwise would be. 8. I consider that the soldiers' occupations and duties in barracks exert a direct influence on the prevalence of epidemic disease, by checking its advance and lowering its intensity; his habits on the march and in the field render him more liable to the prevalence of epidemic disease. 9. Small doses of quinine have not been tried at this station as a prophylactic against malarial disease. 10. For the prevention or mitigation of epidemic disease I would recommend the never overcrowding of men, avoiding long tedious parades in the rainy season (at which period epidemic cholera almost always makes it appearance), giving the men as much liberty as possible, and providing them with rational amusement and recreation, in which, I think, the officers ought to join, in as far as the discipline admits of.

References to Subjects and Queries.	Replies.
V. Intemperance.	1. The soldiers at this station are rather intemperate, but there are no confirmed drunkards amongst them. 2. The proportions which admissions into hospitals from diseases caused directly by intemperance bear to the total admissions is perhaps one-sixth, and indirectly from this cause, half. There is no statistical table kept to show the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at this station. Drunkenness is always punished as an offence. 3. Distilled spirits are sold in the canteen, but are not allowed in the bazaar. Quality is good, and the average quantity consumed by each man per diem may be two drams. Spirit does not form part of the soldier's ration at the station, on march, or in the field. I consider its effect on health injurious to the last degree, as nothing tends to inculcate drunkenness more than the morning spirit ration. Spirit is never given as a ration to convalescents. No other drinks injurious to health are sold at the canteen or bazaar. 4. The consumption of spirits by troops and convalescents is injurious to health, and not conducive to the efficiency and internal discipline of the corps. 5. It would be most beneficial to the health of troops to restrict or abolish the use of spirituous liquors. 6. I consider the influence of malt liquors and wines as conducive to health, but the use of spirituous liquors as most detrimental. 7. Coffee, tea, lemonade, soda-water, and similar drinks are not used at this station. Their influence on health, discipline, &c., is far superior as compared with spirits, and they exert an equally beneficial influence when compared with malt liquor. 8, 9. It would be beneficial to suppress altogether the spirit ration, and to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, coffee, tea, lemonade, &c., to be sold to the troops; but it might be injudicious, as the men who wanted spirits would get the country liquor, which is very deleterious, if they could not get the other. 10. I have no other recommendations to make on these points. 11. No reply to this query.
VI. Diet.	1. The daily ration for British troops consists of bread, 1 lb.; meat, 1 lb.; rice, 4 oz.; sugar, 2½ oz.; tea, ⅓ oz., or 1⅔ oz. of coffee; salt, 1 oz.; vegetables, 1 lb.; and firewood, 3 lbs. Beef should be issued five times, and mutton twice a week, and the bread should be equal in quality to that used at the officers' mess; the rice and salt should be equal to a fixed muster, approved of by the commissariat department in communication with the regimental authorities. When tea, which is ⅔ black, ⅓ green, is not procurable, or coffee preferred to it, the latter is supplied. The firewood is dry, split, and ready cut for immediate use. There is an inspection of the ration by the quartermaster and quartermaster-serjeant every morning at sunrise; when there is no quartermaster, by the commanding officer or subaltern on duty. 2. Such vegetables as are in season are issued to the troops, and no pecuniary compensation is allowed in lieu, as they form part of the ration. Fruit is not supplied to the troops. Soldiers at this station have three meals a day, namely, breakfast at 8 a.m., dinner at 1.30, and tea at 6 p.m. At the two first the men eat meat, at the third, tea, bread, onions, radishes, or anything they like or can get. The stoppage is 5*d.* per day, or Rs. 6. 5. 4. per month, that is to say, this is the allowance each man gets when not supplied with rations. 3. The ration can hardly be improved, and no arrangements are necessary for preventing the disposal of any part of it, as the men consume it all. 4. Government supplies the cooking utensils available at this station. There are four messes in a company, and each mess is supplied with :— 1 Copper boiler of 8 gallons, with cover, weighing 21½ lbs. 1 „ „ 7 „ „ „ 20½ lbs. 1 „ „ 2 „ „ „ 9 lbs. 1 Copper frying-pan 12 in. × 10 in. × 2 in., with iron handle, 10 in. long. 1 „ ladle, diameter of bowl, 5 in., „ „ 18 in. „ 1 „ „ „ „ 3 in., „ „ 13 in. „ 1 Gridiron of same dimensions as frying-pan. 1 Chopper, blade 11 in. × 4 in.; handle, 6 in. 3 Baskets, each 30 in. diameter, and 9 in. deep. The copper boilers should fit into one another so as to form a compact nest. Carriage is allowed for the cooking utensils on a march, and the commissariat department renews or repairs them when necessary. They should be tinned twice a month, and should be marked before issue with the regimental and company mark of the regiment and company to which they are issued. The kitchens are tolerably clean, and sufficiently supplied with water, but are badly lighted and ill ventilated. The cooking is properly done and sufficiently varied, and tea and coffee are also properly prepared for the men. The troops do not have any refreshment before a march, but generally make arrangements for having tea or coffee half-way. 5. Gardens for the cultivation of vegetables by soldiers could be advantageously established near the station, under the regulations lately laid down by H.E. the Commander-in-Chief.
VII. Dress, Accoutrements, and Duties.	1. The dress of the soldier at this station is the same as at other stations, being the regulation dress of the various services, and is suitable to the climate, and for the soldier's duties by day and night. I consider that the light wicker helmet ought to be worn at all seasons, whether on the hills or plains, flannel under-clothing summer and winter, collars low, free and easy about the neck, and on the hills worsted socks the whole year.
Duties.	1. I consider it would be advisable, as regards the health of the men, that they should be thoroughly drilled at home, or at some intermediate station, before being sent to India. 2. In the very hot weather the men certainly suffer from drill, and the medical officers of the artillery, as well as the commanding officers, have seen repeatedly so much benefit arise from discontinuing drill, that all duty in this corps is reduced to a minimum. There are no drills, only a roll-call every morning and evening, and the men are kept in barracks from seven in the morning till half an hour or an hour before sunset. The best time for drills and parades, in the hot season is from half an hour before sunrise to half an hour after the sun is visible, and in the cold season from sunrise till 9 a.m. For marches, from 1 a.m. to 5 a.m.

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References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*Duties—cont.*	or from sunset to midnight, during the hot months, and in the cold weather from sunrise till 9 or 10 a.m., are the best times. The average number of nights the men at this station have in bed is about five. 3. Guards are mounted at a distance of less than 50 yards from the barracks; they are relieved daily. The native guard in the fort, and the civil court guard are relieved once a week. At times, after heavy falls of rain, in the hot and cold seasons, I have seen the men on guards suffer from rheumatism and intermittent fevers; I should recommend the guards to be relieved as frequently as possible.
VIII. Instruction and Recreation.	1. There are very few means of instruction or recreation at the station, there being only one ball-court in the fort, none in cantonment; no skittle-ground in the fort, two in the cantonment; there are, however, schools with good schoolmasters; there is a library belonging to the artillery company in the cantonment, but the room is in the barracks, and quite unsuited to the purpose. There is neither day-room nor soldiers' club, soldiers' gardens, workshops, theatre, or gymnasia, consequently the men are not sufficiently occupied during the wet season, or during the heat of the day. There is a restriction during the hot weather against exposure to the sun, and it is supposed to be beneficial to health. 2. Too much cannot be done to increase the means of recreation and employment. This subject is under the consideration of H.E. the Commander-in-Chief, and reports have been called for in a general order dated 6th October 1860. 3. Soldiers' savings banks are in existence. 4. During the hot season the men are confined to their quarters, as any exercise would prove detrimental. The means of shade from trees, verandahs, &c., are quite sufficient during the cold season.
IX. Military Prisons.	1. The sanitary condition of the military prison at this station is highly defective. The cells are much too low, badly ventilated, being shut in on every side, and situated near the fort ditch, which is too close, and are occasionally overcrowded. I would suggest that cells well ventilated, with a large open yard should be built in cantonments, as I conceive it next to an impossibility to remedy the defects of the present building.
X. Field Service.	1, 2. There are no local regulations for field medical service not included in the general presidency regulations. The practical working of the powers of the medical officers is good, as their suggestions are almost invariably attended to. 3. The practical operation of the regulations in camp for the preservation of the health of the troops, as to the selecting of camping-grounds is good, as to cleanliness, water-supply, &c. Every means are taken to keep a camp clean, and the water is supplied by carriers, who are always sufficient in number. All recommendations of medical officers are attended to when practicable. I have no improvements to suggest. 4. The arrangements for the formation of field hospitals are carried out by the deputy inspector general, who accompanies the force, and who generally selects the medical staff, he countersigns all the indents, the commissariat supplying all the bazaar and country medicines, linen bandages, and other necessaries. European medicines are indented for on the public stores in camp, or the nearest depôt, and to each field hospital a medical storekeeper is appointed of the rank of assistant surgeon. The proportion of doolies for the sick and wounded is 10 per cent. All these arrangements require the sanction of the officer commanding. Copies of the medical regulations are forwarded.
XI. Statistics of Sickness and Mortality.	1. There are no returns under this head.
XII. Hospitals.	1. Plans of the elevation of the hospital have been forwarded. 2. The hospital is situated on the left rear of the barrack, and is about half a mile from the stables; the bazaar and the houses of the civil population are about 200 yards distant. The site of the hospital is open, freely ventilated, and generally healthy. 3. The water-supply is abundant and wholesome. 4. There are no sewers for removing refuse water and other impurities from the hospital, but other means are employed. 5. The height of the lowest wards is 2 feet from the ground, or natural surface, and there is no ventilation under the floors. The roof water evaporates or is absorbed. Arrangements are made to prevent water from standing near any buildings, and I believe they are efficient. The hospital is built of bricks and mortar, the roofs and wall are single, it is kept I believe tolerably cool. Similar verandahs to those of barracks afford shelter from the sun's rays; but I have never had occasion to use them for the accommodation of the sick, convalescents, or any others. The hospital consists of one flat only.

Table of Hospital Accommodation.

Wards or Hospital Huts, No.	Regulation No. of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.
		Length.	Breadth.	Height.	Cubic Contents.	
2	20	72	20	20	28,800	1,420

The hospital is so situated as to receive the benefit of the prevailing winds. The windows open the same as in barracks.

6. The wards are ventilated by punkahs and open ventilators at the ridge; I think they are hardly sufficient. There are neither jalousies or jhilmils.
7. The means employed for cooling the air are the same as in barracks, by means of punkahs tatties, and thermantidotes.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	8. The hospital is warmed by stoves and woodfires in the winter months. The walls and ceilings of the hospital are generally cleansed and limewashed once a year. 9. The privies are detached and situated 10 yards from the building; no water is used for flushing, as it would increase the nuisance; if the filth is removed directly, which it should be, they would not be offensive. 10. The lavatory arrangements are sufficient for ordinary purposes; long earthen vessels are used, well filled with a constant supply of fresh water. The sanitary arrangements are amply sufficient. 11. A large moveable bath is available for the sick when necessary; it is amply sufficient. 12. There are washermen attached to every hospital for the purpose of washing and drying hospital linen; they are amply sufficient. 13. The storage is sufficient and dry. 14. There are no bedsteads in use in the hospital; large cots, with wooden framework of sufficient strength are substituted; coarse Indian cloth, lacing with strong Indian twine to the framework, forms the portion of the cot on which the mattrass rests; the mattrasses are are lined generally with tow and covered, with Sālû bolsters, pillows with linen pillow cases, sheets, and what are called "resais," formed of a good substantial woollen material and lined inside with wool, constitute the beddding. I have no improvements which I can suggest. 15. The hospital kitchen is a large square building, after the style of the natives, with the apparatus used by native cooks, and consists principally of small fireplaces, called "chulas." The cooking is effected by dry wood and charcoal, and is amply sufficient. A medical officer has very seldom to find fault with the cooking. The building is situated about 30 yards from the wards. 16. No reply. 17. The attendance on the sick consists of an apothecary, assistant apothecary, hospital apprentice, a hospital surgeon, native compounder, native dresser, and ward coolies; such attendance is sufficient. 18. The sanitary condition of my hospital is good. No epidemic disease (with the exception of cholera in 1857), hospital gangrene, or pyæmia has appeared in the wards. I am unable to account for the cause of epidemic cholera appearing here in 1857. 19. There are no sanitary defects. 20. The hospital compound is large, and there is plenty of ground for convalescents to take exercise in. No shaded walks exist as they would impede the free circulation of air around the hospital. No seats are available, as the men generally sit on the edges of the verandah. 21. A small detached bungalow has been made available for the soldiers' sick wives and children. The present arrangements are very unsatisfactory, as the building is low, unusually hot from being tiled, ill-ventilated, and contains but little space for the sick; the building is simply the quarters of a non-commissioned officer, and never was intended for a hospital. I would recommend a proper building being erected. 22. There are no special local hospital regulations, which are not included in the general presidency medical regulations. 23. In the internal economy of the hospital, its sanitary state, dieting, and other comforts, the medical officer has full power. The repairs of building are carried out on his requisitions, countersigned by the officer commanding the station. 24. There are no wards for convalescents. At large stations, such as head-quarters of divisions or where there is a large general hospital for the troops, a hospital for convalescents would be advantageous, but at small stations, such as Govindghur, I should not think such an arrangement necessary.
XIII. Burial of the Dead.	1, 2. The burial ground is a mile and half from the station and is to the leeward; it is about 100 yards square, and is, I believe, properly kept. 3. As regarding the burial regulations, I am not aware of any specified space, as much ground as is required is generally taken up, The grave is about 6 ft. deep, it is never reopened, and contains one body only. At ordinary times the interment takes place within 24 hours in the cold season, and in the hot weather as soon as the necessary preparations are effected, as a general rule, about 12 or 18 hours after death. In epidemics, coffins are kept ready, so that no time may be lost, they are buried within 8 or 12 hours after death. There are no burial grounds for native troops. The soldiers of the Hindoo caste burn the bodies of their comrades, and the Mussulmen generally remove the bodies of their comrades some two or three miles from the station for interment. The removal of the body from the lines or hospital requires the sanction of the medical officer; generally the corpses of the native soldiery are removed between six and eight hours after death, whether at ordinary times or during epidemics. 4. The graveyard is never offensive. No precautions are necessary, as both Europeans and natives respect its precincts, and from this being a new station for Europeans troops, the graveyard is to a great extent unoccupied. The rules for the burial of the dead are laid down at page 80, sec. xiv., par. 19, of the military regulations. Funerals, therefore take place either at sunrise or half an hour before sunset. 5. The dead of camp followers or bazaar people are removed by the bazaar people themselves, and are either burnt or buried according to caste. The bodies are always inspected by the medical officer before removal. 6. No injury accrues to the public health from the present practice. 7. I consider the present system works remarkably well, and would feel unwilling to make any alterations in the disposal or burial of the dead.

(Signed) R. Warburton, Lieut-Colonel,
Commissioner at Umritsir.
S. W. P Maclean, Assistant Surgeon.
Garrison and Assitant Surgeon, Umritsir.
R. H. Palmer, Lieut. Artillery,
Assistant Engineer, Umritsir.

Umritsir,
23rd November 1860.

J. C. NYNEE TÄL. BENGAL.

NYNEE TÄL.

Accommodation { Queen's Troops. Infantry - - - 740.
Native Troops. Infantry - - - 230.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The aspect of the country surrounding the station is mountainous. There is a great deal of wood in the station and its vicinity, and numerous running streams, which become mountain torrents in the rains, but nearly dry up in the summer. 2. The elevation of the lake above the sea is 6,409 feet above the sea. Round the lake rise hills on all sides. The highest Cheenur is 8,750 feet above the sea, and 2,241 above the lake. Over the one ridge the country gradually slopes down to the plains; over the other continues the mountainous district of Kumaon. In the centre of the station, and the most striking feature in it, is a lake three-quarters of a mile long by a quarter of a mile broad. It is fed chiefly by springs, but in the rains the mountain torrents pour into it on all sides. The houses are studded over the hill side from a few yards to 1,200 feet above it. The site fixed on for the cantonment for invalids is at the east extremity of and beyond the limits of the old station of Nynee Täl; it is an excellent position. The elevation of the permanent barracks will be a few hundred feet above that of the lake. The temporary ones are lower. 3. The station is a valley in the heart of the mountains. 4. The lake is in the centre of the station; but the vicinity is not liable to overflow, and the natural drainage is perfect. The station is full of ravines and broken ground, but with good natural drainage, and at this elevation they are not of much consequence, except as affording facilities for concealing filth. 5. The station is perfectly open. The high hills do not prevent free circulation of air. The temperature of the station is not raised by exposure to reflected sun heat. The station is exposed to winds which are bracing and conducive to health. 6. The country surrounding the station is very little cultivated, and there are no works of irrigation in the neighbourhood. Rice is not cultivated within several miles of the station, the ground not being suitable, but it is largely grown in the valley, where water is available for irrigation. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The nearest native population is a small bazaar in the centre of the station. 8. The mountains are of limestone with a very thin coating of light gritty soil. In the valley the soil also is very spare, and mixed with large quantities of débris. 9. There is only one well in the station, and that is in a small valley. The water there lies at a depth of 11 feet below the surface in the dry weather; but during the rainy season at not more than one foot. 10. All rain water, and water from surface springs in the district, is rapidly carried into the lake, and this at one extremity feeds a mountain stream. There is no adjacent higher ground, the drainage from which can pass into the subsoil of the station. 11. The water supply of the station is derived partly from springs, and partly from the lake. There are no tanks. There are plenty of fish in the lake, and along its margin a luxuriant water plant. The lake is used both for drinking and bathing purposes, and also for washing; but the body of water is too large to be deleteriously affected by this. A separate ghat, which might easily be made at a slightly lower level than the lake, ought to be constructed for the dhobies, and no washing allowed in the lake itself. 12. There is available for the station an unlimited supply of pure and wholesome water, soft and excellent. The water is raised by bheesties who fill their "musuks" either from the lake or springs. The supply for the barracks is conveyed from the eastern extremity of the lake in a wooden water-course. Before leaving the lake it ought to be filtered through a series of charcoal beds. This might easily be managed, the fall of water allowing every facility for it. 13. No reply to this query. 14. New stations are selected by a committee composed generally of the officer commanding the division, the deputy assistant quartermaster-general, a civil officer, the executive engineer, and one or more medical officers. Before any site is determined on for a cantonment, in the plains especially, an engineer and medical officer should be appointed with, say, one regiment of natives to reside on the spot for one year, to watch the natural drainage, the meteorological phenomena, and above all the health of the troops, and of the surrounding inhabitants.
II. CLIMATE.	1. An ordinary thermometer and a rain gauge, are the only instruments available at this station for conducting meteorological observations. 2. The following register was kept with great care by General Sir W. Richards, K.C.B., from the 1st January 1846 to 31st December 1853.

RANGE of the THERMOMETER and STATE of the WEATHER at NYNEE TÄL from the 1st January 1846 to the 31st December 1853, Eight Years.

Years.	At Daylight. Average In.	At 2 P.M. Average In.	At Daylight. Average Out.	At 2 P.M. Average Out.	State of the Weather. Generally fine.	Generally cloudy.	Rain, Hail or Snow.	Quantity of Rain fallen. In.	10ths.	100ths
	°	°	°	°						
1846	59½	61	50¼	65	„	„	„	120	„	„
1847	58½	60¾	50¼	63½	202	55	108	101	1	80
1848	58¾	59	51½	65½	234	53	79	68	„	15
1849	60	60¾	54½	66	226	59	80	73	1	61
1850	59¾	60¼	51	64½	206	78	81	89	8	48
1851	60¼	61	52¾	66¼	228	77	60	82	6	72
1852	58¾	58¼	50¼	64¾	200	87	79	125	3	„
1853	58½	60½	52	64½	241	67	57	144	4	65
Average of Eight Years	59½	60⅓	51⅓	64¾	220	68	78	100	5	80

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. The climate of Nynee Täl is excellent. In the rains the air is damp; but at other times it is remarkably dry and pure. There are too many trees in the station; one-half might be cut down with advantage. The general residents of the station enjoy excellent health, and go out at all hours of the day. In the summer the sun is very powerful; but as the air is generally cool a good protection for the head removes all inconvenience. The winter months are most healthy and bracing, and best adapted for invalids. In the rains, generally from imprudence on the part of mothers, bronchitis is not uncommon among children; but I have found the cases do well. Nynee Täl is not subject to any endemic diarrhœa, which is so prevalent and intractable at some of the other hill stations. 4. There is no district near the station the climate of which is more conducive to health. 5. I have served at Wuzeerabad, Sealkote, Delhi, Jhansi, Umballa, Mean Meer, Umritsir, Jutogh, near Simla, Seharunpore, Meerut, and Nynee Täl. At some of these my experience was very short. Wuzeerabad has since been abandoned. Sealkote, Umballa, and Meerut, I consider excellent salubrious stations. Delhi, Jhansi, and Seharunpore, very inferior, and fever very prevalent. Jutogh has an unrivalled climate, and would form an admirable site for a European regiment or depôt. *Mem.*—The sanitary station of Nynee Täl was originated in 1842, and has since proved a favourite resort during the hot months for the residents in Rohilcund and adjoining districts. The station consist of a valley about two miles in length by one broad, surrounded by high hills on all sides, excepting at the east and south-west, where the roads from the plains enter the one communicating with Huldwanee, the other with Kaleedoongee. Each of these places is about 15 miles distant from Nynee Täl. In June 1858, owing to the increased number of Europeans, Nynee Täl was selected as a depôt for invalids. The site chosen for the military station is a rising ground, about one mile from the easterly end of the Nynee Täl valley; the ground is open, and in every way well adapted for the purpose. As yet the barrack and hospital are of only a temporary description—very inferior, and badly situated. Plans and estimates for permanent buildings were sent to Government a year ago, but owing to the expense the idea of erecting them has for the present been abandoned. The number of invalids in the depôt this season is upwards of 400. The sanitary station is under my medical charge; the depôt under that of Assistant Surgeon W. P. Pinkerton, R.A. As the military stations, therefore, with all particulars regarding the barracks, the hospital, and all the other matters relating to the troops, do not fall within my observation, Dr. Pinkerton has kindly undertaken to reply to the questions on these heads. JNO. M. CUNINGHAM, M.D., Assistant Surgeon, H.M.I.S.
	The following replies are by W. P. Pinkerton, R.A., in medical charge of convalescent depôt, Nynee Täl:—
III. SANITARY CONDITION OF STATION.	1, 2, 3. The invalid station of Nynee Täl consists of two sets of huts, of temporary construction, the cantonments and permanent barracks not being as yet sanctioned. The lake which forms the chief object in the landscape, is surrounded by hills, covered with foliage; on the sides of which are situated bungalows and the bazaar of the civil station. This sheet of water, one mile long, and half a mile broad, lies due north and south. On the north Cheeny shelters it, while between "Cheeny and Ayapatta," on the west, a narrow gorge lets in the west and south-west winds. On the south the water escapes downwards towards the plains on the north of Bareilly. The gorge which then opens on the plains is narrow and full of rocks, banks of earth, &c. It is in this defile that the men's huts are built. This site is every way objectionable, as many of the huts lie lower than the surface of the lake. There is often a violent rush of wind up and down, and the earth is always more or less damp, and, especially during the rains, a perfect marsh. Table of barrack accommodation; date of construction, 1858; total number of rooms—21 barracks, containing 42 rooms, 50 × 18, with verandah in front. Total regulation number of non-commissioned officers and men, 840.

Barrack Room.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.		Feet.	Inches.		Feet.	Feet.
42 - -	20	50	18	$\frac{11\times17}{2=14}$	12,600	630	45	14	240	4	3
Guard rooms, 3	12	30	20	—	—	—	—	—	—	—	—
Prison cells -	Estimated for, and will soon be constructed.										

5. Most of the windows are on the side opposite the doors, opening in the centre. There is a verandah in front 6 feet broad and 8 feet high. This is never used as sleeping quarters by soldiers or any other persons. Jalousies are used in the huts occupied by married men.
6. Simple rope charpies, with blankets and sheets for the bed accommodation at the station.
7. There are no tents used in camp.
8. There are two ventilators on the roof of each large hut, and one on the smaller ones. Owing to the bad construction of the chimneys constant smoke exists in the huts, otherwise the air is pure. No means are required for cooling the air of barrack rooms.
9. The walls of the barracks are of stone, and the roof is thatched.
10. The floors are constructed of pucka, and raised from 1 to 2 feet above the ground, but there is no under current of air.

NYNEE TÄL. BENGAL.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	11. The huts being merely temporary are not sufficient for the use of the troops. The plan proposed for the permanent barracks would give ample accommodation. They are kept in repair by the Public Works Departments under a sub-contractor. The walls and ceilings are cleansed and lime-washed once a-year. 12. There are no lavatories for the men, who wash in the verandahs, where accommodation is afforded them. 13. The cook-rooms are all temporary, and built of different sizes, as well as the barracks and temporary choolahs. As the buildings are all on the hill-side there is ample fall for all refuse water. 14. The privies and urinals are of different sizes, and being temporary there is no standard plan. A sketch of one, therefore, would not afford a true description. 15. The buildings are ventilated by means of a wooden ventilator, and lighted at night by glazed lanterns. 16. As the barracks are all built on the hill-side there is little or no drainage required. No washhouses exist. The hospital and "near" half of the barracks are very damp, owing to the bad state of the hospital-roof, and its exposed position, and to these huts lying too low and confined. The fluid refuse of the barracks flows down a steep declivity to the plains below. Cesspits do not exist, nor are any required. There are no foul ditches near the station. 17. The surface cleansing of the cantonment is efficiently done. The refuse is thrown down the "khud" and carried off by the water from the lake. 18. The surface of the cantonment is not kept free of vegetation. There are no old walls, thick hedges, &c., interfering with the ventilation of the station or bazaar. 19. Both bazaars are in a filthy and crowded state. No proper drainage nor latrines existing, the stench is at times overpowering. There are no means taken to preserve cleanliness; latrines should be enforced. The native houses near the station are small and badly ventilated. Dung, &c., is generally burnt. The want of public latrines occasionally causes a nuisance in the barracks, which would be of course removed by their adoption. 20. The slaughter house is 300 yards distant from the barracks, and is washed out by a stream of water running from the lake. 21, 22. There are no horses, stables, or picketing grounds at this station. 23. Married men use the same barrack rooms as the rest, divided only by a partition.
Officers' Quarters.	1. The officers live in separate bungalows of their own. There are no improvements to be suggested.
IV. HEALTH OF THE TROOPS.	1. The station, surrounding district, and adjoining native population are generally healthy. 2. Intermittent fever with enlargement of the spleen and variola are the diseases most prevalent among the native population. 3. I attribute the prevalence of the above diseases to sudden and extreme variations of temperature, the presence of dense underwood during the rains, their living in hollows exposed to the sun, and the want of free ventilation. 4. Before their arrival at Nynee Täl the troops were stationed at Lucknow, Allahabad, Cawnpore, Futteghur, Saugor, Gondah, Seetapore, Roy Bareilly, Bareilly, Moradabad, Shahjehanpore, Meerut, Delhi, and Agra. The near half of the barracks lie too low, and are too much hemmed in. 5. The troops at this station are never camped out. 6. I was never in charge of troops at a hill station before coming here; certain improvements in certain diseases, not organic, result from a residence in a hill station. 7. I do not think that troops are more liable to feverish attacks on leaving the hills, save such as are brought on by their own wilful intemperance or exposure to a mid-day sun. 8. I approve most decidedly of selecting hill stations for troops. 9. There are no diseases peculiar to this station to which troops are liable on coming to it. 10. No reply to this query. 11. The periods best adapted for a residence at hill stations are the autumn and winter, and the shortest period of such residence for troops to receive any benefit from it is 12 months. 12. There is no period of residence beyond which troops are likely to receive injury to their health on returning to service in the plains. 13. Troops on leaving hill stations for the plains should be sent so as to arrive at their destination by the middle of January at the very latest. 14. It would be most conducive to the health of troops to send them to head quarters in the hills with detachments doing duty on the plains, and these relieved every cold season. Frequent change of station in the plains is beneficial to the health and spirits of the troops. 15. At present the temporary barrack and hospital accommodation is not sufficient. 16. The most suitable sites for hill stations are obtained at ranges of elevation above the sea varying from 4,000 to 6,000 ft. 17. The proposed new site for permanent barracks is situated close to the far away huts at the height of 100 ft. above, and is freely exposed to all winds, excepting the north, and tolerably free of brushwood. 18. Retentive clay soils are unhealthy for stations, sand and gravel soil more healthy. 19. Soldiers should be sent to India after they have completed their preliminary drill at home, and not under 22 years of age. The best period for them to land in this country is from the 15th October to the end of February. Recruits on first landing in India should be restricted to small quantities of stimulants, have a light diet, and daily baths, and be kept in confinement to barrack rooms during the heat of the day. 20. Troops might be quartered in the Mediterranean previously to their coming to India, and on landing here should be sent immediately to a hill station for two years. 21. Troops on landing are conveyed from the port to the interior by flats up the rivers and bullock carts. 22. I consider ten years the number of years a British soldier should serve in India. 23. The manner of conducting Indian boards is not such as to avoid conflict of opinion as regards invaliding. 24. Invalids should leave India for home in December and January.
Diseases.	1. There are occasional inspection parades at this station for the discovery of incipient diseases. 2. There is no scorbutic disease among the troops at this station.

References to Subjects and Queries.	Replies.
IV. Health of the Troops. —*Diseases—cont.*	3. The majority of cases of hepatitis arrive from the plains. 4. No case of dracunculus has occurred here. 5. The establishment of lock hospitals would be advantageous. 6. The troops at Nynee Tal suffer from the following diseases, viz.:— *Fever.* Intermittent quotidian. *Dysentery.* Not local, but originating in the plains. *Cholera.* No case of this disease. *Small-pox.* One case. *Rheumatism.* Chronic form, originating in the plains, and not improved by this hill station. Acute, originating here from exposure to cold and wet, occurred last rainy season. The following is the proportion which admissions and deaths from the above diseases bear to the total admissions and deaths.

Diseases.	Admissions.	Deaths.
Feb. Quot. Intermittent	1 to 16·464	None.
Dysentery. - -	1 to 14·818	1 to 244·5
Small-pox - -	1 to 489·	None.
Rheumatism - -	1 to 11·929	None.

7. Intermittent fever is the prevailing disease in wet seasons from June to August. Hot moist air and chilly air generally precede or accompany their appearance. They are most prevalent in the native houses near the edges and below the level of the lake. Exposure to the sun during mid-day predisposes to these diseases.
8. No duty at this station can interfere with the general health of the troops.
9. For fever cases arriving from the plains five grains of quinine a day are generally used with good results.
10. For the prevention or mitigation of epidemic disease at this station I would recommend diminishing the amount of vegetation all round the cantonments, the formation of a large tank for bathing purposes, and the introduction of public latrines among the natives.

V. Intemperance.

1. The soldiers at this station are temperate, and there are no confirmed drunkards among them.
2. Only one case of delirium tremens took place last year. All the men at this station being invalids, require a daily amount of stimulant. Drunkenness is always punished as an offence.
3. Distilled spirits are sold both at the canteen and bazaar. The former supplies each man with one quart of beer and one dram of rum daily; spirit forms part of the soldier's ration at this station. The quality is good, but none is served before 12 at noon. Native spirits sold at the bazaar are very injurious to health.
4. The consumption of spirits in the amount above specified is conducive to the health, efficiency, and comfort of the men.
5. It would be injurious to deny the men their daily allowance of spirit; but its sale at the canteen should be kept under proper restrictions, and that in the bazaars entirely suppressed.
6. The use of malt liquor or wine is much less hurtful than that of ardent spirits.
7. Coffee and tea are used here. The use of these alone, if practicable, would certainly improve the general health.
8, 9. Generally speaking, the suppression of the spirit ration would be beneficial, but there are exceptions, many men labouring under abdominal diseases, not being able to drink beer without inconvenience.
10. Beer only should be drank in the forenoon, if required, and spirits not till after sunset.
11. Copies of the bazaar and canteen regulations are not to he had.

VI. Diet.

1. The rations for Queen's British troops and European troops in the Indian army is the same, and consists of beef, bread, potatoes, onions, rice, and "longee." The rations are served out every morning before the officer of the day.
2. The soldier here has three meals a day, at 9 A.M., 1 P.M., and 5 P.M., and meat once a day. One pound of vegetables enters into the ration.
3. It would be an improvement to have the dinner served at between 4 and 5 P.M. instead of during the mid-day heat, breakfast with meat having been previously served at 9 A.M., with bread and tea at 7 P.M. There is no arrangement to prevent the disposal of the rations.
4. For cooking purposes "dagchees" and wood fires are furnished. The kitchens are well lighted and kept clean, and for temporary purposes they are well provided. The food is generally boiled, and the cooking is satisfactorily done. The men occasionally have coffee before a march.
5. Gardens for the cultivation of vegetables by soldiers could be advantageously established near this station. A supply of seeds of different sorts for kitchen gardens should be given. "Good conduct" and "steady" men should alone have charge of them.

VII. Dress, Accoutrements, and Duties.

1. The soldiers at this station have the usual warm clothing during the winter, and light clothing in the summer. The dress is quite suitable to the climate and to the soldiers' duties by day and night. Solar helmets should be used always during the mid-day sun, even in the hills, and men on guard at night should be compelled to wear flannel belts around their bodies. Loose jackets are worn in the day, great coats at night.

Duties.

1. Troops should not be sent to India before being thoroughly drilled at home.
2. The best times for drills, parades, and marches is from 5 to 7 o'clock in the morning.
3. The guard-room is in the centre of the barracks, and the men are on 24 hours at a time. There is one parade in the morning and one roll-call at 4 in the afternoon. There are occasional complaints of slight rheumatism or diarrhœa after a night's duty, which would be easily obviated by proper attention to warm clothing.

VIII. Instruction and Recreation.

1. The following are the only means of instruction and recreation at the station; two skittle grounds, one school, with schoolmaster, and one library, well supplied with books and well

NYNEE TÄL. BENGAL.

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	lighted. These are hardly sufficient to keep the men occupied in the wet season and during the heat of the day. The men are confined to barracks during the heat of the day. 2. I would recommend soldiers' gardens, soldier's clubs, and occasional examinations on Fridays for the best drawings or military sketches and knowledge of any specified kind or description, according to the inclinations of the individual. 3. There is a soldiers' savings' bank in operation at present, and it appears to be advantageous. 4. The shade afforded by verandahs is not sufficient for the exercise of the men.
IX. MILITARY PRISONS.	1. There are two well-built cells at this station, scarcely ever required.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the General Presidency Regulation. 2. The only power a medical officer has is to advise as to any choice of site for a camp, and the occasional moving after two or three days living on one piece of ground. 3, 4. No replies to these queries.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.
XII. HOSPITALS.	1. Sketch of the hospital is transmitted. 2. The hospital is close to the nearest huts, and one mile from the farthest, one mile from the big bazaar, and close to the small one. The site, which is on top of a mound, is healthy and freely ventilated. 3. The water supply is abundant and wholesome. 4. No drainage is required. 5. The lowest wards on the south side are 6 inches above the ground, and those on the north side ten feet. The roof slants on each side, the rain running off by gutters. The hospital is built of rubble stone and lime cement. There are open verandahs ten feet wide on all sides not used for sick. The hospital consists of two flats, with four wards above and seven below. Total number of wards - - - - - 11 Total regulation number of beds - - - - 45

Wards.	Regulation Number of sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft. in.				In.			
No. 1 - -	6	25	17	12 8		Depends on the No. of patients, which here is very fluctuating and uncertain, from 50 in the summer to 5 or even 3 in the winter.		14	2	9	5
2 - -	6	19	17	12 8				"	"	"	"
3 - -	6	19	18	12 8				"	"	"	"
4 - -	4	17	16	12 8				"	"	"	"
5 - -	4	17	16	12 8				"	"	"	"
6 - -	4	16	16	12 8				"	"	"	"
7 - -	4	17	16	12 8				"	"	"	"
8 - -	4	17	17	10 0				"	"	"	"
9 - -	4	17	15	10 0				"	"	"	"
10 - -	4	17	15	10 0				"	"	"	"
11 - -	4	17	17	10 0				"	"	"	"

The hospital is too freely exposed to the prevailing winds. The windows open in the centre; but there are too many in this hospital, and owing to the exposed position they cannot always be open.

6. It is scarcely possible to ventilate these wards properly, as the draught caused by open windows and doors is too strong. There are no jalousies or jhilmils.
7. There are no means in use for cooling the air of the wards.
8. Fires used for warming the wards. The walls and ceilings are cleansed and lime-washed once every 12 months all over, and every three months six ft. high.
9. The privy is a simple stone hut, with seats enclosed, and kept clean by sweepers. It is not offensive.
10, 11. Chatties and tubs are provided for lavatory purposes, and are sufficient for the sick, who are, however, bathed in the lake.
12. The washing and drying of the hospital linen are performed by the regular establishment of native washermen.
13. The storage is sufficient and dry.
14. Cots, with string and newar bottoms are generally used in hospital.
15. The kitchen is on the north of the hospital, below the level of the wards.
16. Copies of the diet tables, diet rolls, &c. are transmitted.
17. The establishment for attendance on the sick consists of one hospital sergeant; one European barber, and one European orderly.
18. The hospital is in a healthy position, and no epidemic has appeared in its wards. During the rains, however, open surfaces of blisters &c., do not heal kindly.
19. Besides the hospital being too much exposed there are too many doors and windows in the wards, which again are too small.
20. There are 2 "jampanns" or chairs at this depôt, in which the sick are placed to take the air, and are carried by 4 coolies. There are walks shaded and cool on the west side of the lake, and also the verandah for the exercise of convalescents.
21. There is one room kept solely for sick women and children. All the present arrangements are temporary and unsatisfactory.
22. There are no local hospital regulations not included in the General Presidency Medical Regulations.
23. The medical officer has power to have any nuisance removed, and repairs done, and in camp the hospital removed any number of yards, by application to his commanding officer. In the diet, &c., of patients, &c., he has supreme power.
24. No convalescent wards. All the men here are invalids.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1, 2. The burial ground for British troops is 2½ miles from the farthest huts. The drainage is good, and decomposition takes place rapidly. The ground is well kept. 3. The grave space is eight feet by four, with an interval of three feet between each. They are six feet deep, and have never been re-opened as yet. Interment at ordinary times takes place within 24 hours after decease, and during epidemics within 12 hours. 4. The grave yard is never offensive. If possible British troops are always buried during early morning in the consecrated cemetery. 5. The dead of camp followers and bazaar people are burnt or buried according to caste. 6, 7. No injury accrues to the public health from the present practices, nor are any improvements to be suggested. Memorandum. In reply to the memorandum affixed to this book on its return, I beg to state that the questions contained in that small portion of the report, which it fell within my province to to answer, were not replied to concurrently by the commanding officer, the engineer and myself, because the sanitary station of Nynee Täl to which alone I refer has no commanding officer, but under the jurisdiction of the municipal committee, and because there was no engineer officer present above the rank of a sub-conductor in the P. W. D. whose opinion I did not think would be of sufficient value to record." Nynee Täl, 5th December 1860. (Signed) Jas. M. Cunningham, M.D., Assistant Surgeon. Memorandum. "The questions were not answered by me concurrently with the resident engineer, there being no officer at the station belonging to that department above the rank of a sub-conductor. In a convalescent station like this several questions put down can be answered only partially." Nynee Täl, 2nd December 1860. A. W. Pinkerton, Assistant Surgeon in Medical Charge of Convalescent Depôt. "Dr. Cunningham's report extends only to page 197 (end of "climate.") The remaining questions are replied to by Dr. Pinkerton, R.A., in charge of the depôt."

(Signed) John Drysdale, R. H. Commanding.
Jas. M. Cunningham, M.D. Assistant Surgeon, H. M. I. S.
A. W. Pinkerton, M.D., in Medical Charge of Depôt.

16th June 1860.

MEERUT.

Accommodation
- Queen's Troops
  - Artillery - 800.
  - Cavalry - One Regiment.
  - Infantry - One Regiment.
- Native Troops
  - Cavalry - One Regiment (none present).
  - Infantry - One Regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is sandy, flat, and open, and generally dry. There is no jungle, and but little wood or water in the vicinity of the station. 2. The elevation of the station above the sea is about 900 feet, and from 1 to 100 feet above the adjacent country. The elevation above the nearest water—the Kalee Nuddee, about four miles distant—is 110 feet. There is no higher or healthier ground adjoining Meerut. 3. The nearest mountain or tableland is the Sewalik range of hills under the Himalayas. The height of this range above the level of the station is 3,123 feet. They are distant about 70 miles. 4. The nearest water is the Kalee Nuddee, about four miles distant to the south-east. The vicinity is liable to overflow during extraordinary floods in the rainy season, but not for more than a few hours. There is no broken ground nor any ravines or water-pits near the station. 5. The station is open, and freely exposed to the winds. Free internal ventilation exists generally, but varies according to the locality. The temperature of the station is probably raised by exposure to reflected sun heat, but to what precise extent cannot be said, as no register of the comparative temperature with that of the open country has been kept. The station is exposed to cold winds in the months of November, December, January, and February. There are land winds also, generally from east or west, the latter being most prevalent and most healthy. 6. The surrounding country is cultivated, and irrigated by the Ganges canal, about nine miles distant from the station. Artificial irrigation does not, however, affect the health of the station. The cultivation of rice is strictly prohibited within cantonment limits. No indigo is cultivated or prepared near the station, but hemp is prepared in all directions out of the station and cantonment limits.

MEERUT.
BENGAL.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	7. The town of Meerut is situated to the south about a mile distant from the lines of the European troops. 8. The surface of the district is a pervious sandy loam, with a subsoil, at some depth, of white sand and kunkur nodules. In some places beds of kunkar exist. The station was built originally on new ground. 9. Water is found during the dry season at a depth of 18 feet below the surface, and at a depth of 16 feet during the rainy season. 10. The rain-fall flows readily away. There are no surface springs in the district within which the station is situated. No drainage from higher ground passes into the subsoils of the station. 11. The water for drinking purposes is obtained from wells. There are also tanks for bathing (used only by natives) and for washing. The extent of tank surface within the station and within half a mile of it is about 2,229,397 feet superficial. The tanks are never dry, but are fullest at the close of the monsoon. No tank used for drinking purposes is also used for bathing, nor are any of the tanks liable to pollution from leaves or other matter falling into them or from any other cause. Nuisance and perhaps malaria proceeds from some of the tanks near the station, the only effectual means of preventing which would be to fill them up. 12. The amount of water supply for the station is unlimited, and it is soft and excellent in quality. It is raised by leathern buckets and bags, varying in size according as it is raised by hand or by cattle. 13. There are no other topographical points bearing on the health of the station not included in the above replies. 14. New stations are selected by special committees convened for the purpose under the orders of the Government, and composed of medical officers, aided by the executive engineer. Every practicable inquiry is made as to topography, climate, diseases, sanitary condition, &c. &c.
II. CLIMATE.	1. The instruments available at the station for conducting and registering meteorological observations are a barometer, thermometer unattached, wet bulb thermometer, thermometer in the sun's rays, and a pluviometer. 2. Table of Meteorological Observations for one year, from the 1st January 1859 to 31st December 1859.

Months.	Barometer. Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain. Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Low Wind, Storms, &c.
January -	29·272	60·64	22·94	72·39	49·45	60·64	56·86	86·77	0·21	Westerly	Not noted.	Not noted.	Not noted.
February -	29·272	64·50	19·	74·	55·	64·50	60·25	85·	0·16	Do.			
March -	29·191	69·50	18·	76·	58·	69·50	63·95	99·55	1·80	Do.			
April -	29·072	82·51	21·13	91·93	70·80	82·51	67·18	105·93	2·58	Do.			
May -	29·006	89·74	26·55	103·03	76·48	89·74	77·78	118·67	0·04	Variable			
June -	28·748	91·75	14·53	97·33	82·80	91·75	81·55	113·13	3·56	Do.			
July -	28·845	87·65	14·64	99·25	84·61	87·65	82·54	117·09	1·47	Easterly			
August -	28·587	84·25	12·08	92·08	80·	84·25	75·75	99·	5·88	Variable			
September -	29·000	82·25	9·00	85·00	76·00	82·25	77·75	101·	1·43	Do.			
October -	29·199	76·25	27·00	90·00	63·00	76·25	72·50	103·	0·00	Westerly			
November -	29·295	63·25	31·00	81·00	50·00	68·25	63·50	96·	0·00	Do.			
December -	29·372	60·73	16·28	69·00	52·72	60·73	54·00	84·06	0·76	Do.			

	3. The climate of the station is good, being dry for a great portion of the year, and not variable. Fogs are very rare, and the climate is not affected by the canal and well irrigation. There is much dust during the dry seasons, but it does not render the atmosphere unhealthy. The climate has no bad influence on health, and no peculiar diet is required for the troops. Tatties, punkahs, and free ventilation are, however, absolutely necessary. Light clothing is required in the hot season, and warm during the cold. Drills should be light and enforced very early in the mornings only, so that the men may return to quarters by six or half-past six a.m. during the hot weather. The most healthy months are December, January, February, and March, and the most unhealthy August, September, and October, when intermittent, remittent, and continued fevers prevail, as well as catarrh, diarrhœa, dysentery, and hepatitis. 4. There is no district near the station the climate of which is more conducive to health. 5. I have served at several stations in the North-west provinces, Punjab, and Bengal, and in my opinion the comparative salubrity stands as noted above.
III. SANITARY CONDITION OF STATION.	1, 2, 3. All the plans of the station, district, and barracks were submitted with the original copy of this report through the Deputy-Assistant Quartermaster-General's office. If copies of these plans are indispensable a delay of some months must ensue, as the office draughtsman of the executive engineer has his hands constantly employed in current work, and the original copy will be required back again. 4. Table of barrack accommodation :— Date of construction of barrack, 1810, 1819, 1828, 1830, 1832, 1833, 1834, 1842, 1845, 1847, 1854, 1858, 1859. Total number of rooms - - - - - - 705 Total regulation number of non-commissioned officers and men - 4,227

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Ft.				Number.	Height.	Width.
European Infantry Lines.											
54 centre wards	16	50	24	25	30,000	1,875	75	2	—	—	—
108 side do.	6	44	12	15	7,920	1,320	88	1½	—	—	—
108 do. do.	4	25	12	15	4,500	1,125	75	1½	—	—	—
216 corner rooms	1	15	12	15	2,700	2,700	180	1¾	1	6	4
European Cavalry Lines. 10 Barracks.											
2 centre wards	68	210½	24	26½	133,878	1,968	74	2	—	—	—
4 side do.	34	210½	12	16½	41,679	1,225	74	1¾	—	—	—
8 rooms	4	18	11½	26½	5,485½	1,371	51	2	—	—	—
2 do.	1	24	14	26½	8,904	8,904	336	2	—	—	—
4 do.	1	24	12	16½	4,752	4,752	288	1¾	—	—	—
Barracks 2, 3, 4, 5, & 9.											
5 centre wards	74	205	22	26½	119,515	1,615	60⅞	2	—	—	—
10 side do.	37	205	9½	16½	32,133	868	52	1¾	—	—	—
20 rooms	1	18	10½	26½	5,008	5,008	189	2	—	—	—
5 do.	1	22	14	26½	8,162	8,162	308	2	—	—	—
5 do.	1	22	12	16½	4,356	4,356	264	1¾	—	—	—
10 do.	1	22	9½	16½	3,448	3,448	209	1¾	—	—	—
Barrack No. 8.											
1 centre ward	66	198	24	26⅓	125,928	1,908	72	2	—	—	—
2 side do.	36	198	12	16⅓	39,204	1,089	66	1½	—	—	—
4 rooms	1	18	11½	16⅓	5,485½	5,485½	2,070	2	—	—	—
4 do.	1	18	12	16⅓	3,564	3,564	216	1¾	—	—	—
1 do.	1	24	14	26½	8,904	8,904	336	2	—	—	—
1 do.	1	24	12	16½	4,752	4,752	280	1½	—	—	—
2 do.	1	28	12	16½	5,544	5,544	336	1¾	—	—	—
2 do.	1	25	12	16½	4,950	4,950	300	1¾	—	—	—
Two Married Barracks.											
48 rooms	1	14	11	19	2,926	2,926	154	1⅜	—	—	—
48 do.	1	11	10	19	2,090	2,090	110	1⅜	—	—	—
Rocket Troop Line's Barrack.											
1 centre ward	72	198	24	20	95,040	1,320	66	1¾	—	—	—
4 rooms	1	18	11¼	20	4,050	4,050	202½	1¾	—	—	—
Two Camel Shed Barracks.											
2 centre wards	68	201	27	14	75,978	1,117	79	1¾	—	—	—
4 rooms	1	10	10	14	1,400	1,400	100	1¾	—	—	—
Rum Godown Barracks.											
3 centre wards	90	215	30	20	129,000	1,400	71	1¾	—	—	—
6 side do.	45	215	10	20	43,000	955	47	1¾	—	—	—
6 rooms	1	23	15	20	6,900	6,900	345	1¾	—	—	—
Artillery Lines. Married Barracks.											
1 centre ward	17	210	24	22½	113,400	6,670	296	1⅔	—	—	—
4 rooms	1	18	11	22½	4,455	4,455	198	1¾	—	—	—
Guard-room	14	40	18	17	30,960	220	122	1¾	1	6½	4½
56 prison cells	1	18		12	1,728	1,728	144	1¾	1	3	1½

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows and doors of the barracks are on opposite sides, and open inwards their whole length. There are verandahs on both sides of the buildings, which upon occasions of great emergency only are used as sleeping quarters. The rule is, that the centre ward only be occupied as sleeping quarters, one verandah for messing and the other for recreation. There are no jhilmils to the barracks. 6. The bedsteads used in barracks are wooden frames with a lacing of tape or cane for the bed. No bedsteads are used in tents. The men are supplied with a mattress of quilted cotton for barracks or camp. It would be a great improvement to substitute an iron band lacing to the beds in lieu of tape or cane. 7. Tents used in camp are of two sizes, one 12 ft. by 12 ft. for staff serjeants, occupied by one man only; the other 20¼ ft. by 15 ft. 10½ in., occupied by 16 non-commissioned officers rank and file, giving 20 superficial feet per man, and about 150 cubic feet of air. The tents are made of three cloths of country canvass, lined with blue, with two flies; in all, six cloths. 8. Besides the ventilation obtained by doors and windows, barracks are ventilated by openings in the roof. Tents have no ventilation beyond that afforded by the door openings. Guard-rooms are ventilated in the same manner as the barracks, and generally the buildings at

MEERUT.
BENGAL.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	Meerut are sufficiently ventilated to keep the air pure both by day and night. The means employed for cooling the air in barrack-rooms and hospitals during the hottest months are tatties or screens, made up of kus-kus grass over frames the size of the doorways. These screens are kept constantly wet by an establishment allowed for the purpose, and the breeze passing through them becomes cooled. Punkahs are also employed for increasing the circulation of air. 9. Barracks are generally built of brick set in limemortar, the roofs being supported on timber trusses, and covered with thatching grass, or tiles, chiefly the former. The construction of the tents have been already described, and there are no huts for soldiers at Meerut. 10. Floors are constructed of stone, brick on edge or brick flat, with concrete terracing over They are generally raised two feet above the ground, in some cases more and in others less There is no passage of air underneath. 11. The materials of which the barracks are constructed are suitable to the climate, and the barracks themselves could hardly be improved, as they are among the best in India. The cantonments, &c. are kept in repair by the executive engineer, and repairs are executed without any unnecessary delay on requisitions of the authorities of the station or regiments by which the buildings are occupied. The officer commanding the station is responsible for the general sanitary state of the cantonments. The walls of the barracks are cleansed and limewashed as a rule annually, and as often as may be deemed necessary on sanitary grounds. 12. The lavatories are permanent buildings, built of burnt bricks and lime-mortar, and are supplied with water from wells. Their number is one per company, besides which there are two plunging-baths to each regiment. 13. The means of cooking are those ordinarily adopted in India, metals pots and pans. Water is supplied by bheesties from wells; the refuse water being collected in small sinks and cleared out daily by the conservancy establishment of the corps. Washing and drying of linen is undertaken by native washermen, whose operations are carried on in the open air in the vicinity of the tanks or wells. These means are sufficient for the wants of the station. 14. The privies and urinals are permanent buildings, built of burnt bricks and mortar. They are drained into cesspools, and the contents of the privies (which are received into copper pans) are removed to a distance from the station in filth carts daily. 15. The buildings are ventilated by roof ventilators, and lighted by windows. The barracks are lighted by oil lamps at night. 16. The mode of draining the barracks is by wide open masonry drains, gradually increasing in depth, and having two outlets, one 1,700 ft. from the barracks, which is a large tank, and the other a nullah, 5,000 ft. distant. The drainage is sufficient for carrying away all surface water, &c., efficiently. No part of any building used as a barrack or hospital is damp to my knowledge. No complaints on the subject have ever been made. The fluid refuse of the barracks is drained into cesspools, which are close to the wash-houses and urinaries. Their dimensions are 4½ ft. diameter by 40 ft. deep. They are distant from the wells 670 ft., and from the nearest barrack 60 ft. They seldom require cleansing, but when this is necessary it is done by opening the tops and drawing out the fluid in buckets. There are no foul ditches in cantonments, but there are some near the city, about a mile from the barracks. 17. The surface cleansing within the cantonments is done by sweepers, but the establishment for this purpose is insufficient. Refuse, manure, &c. is carried away in filth carts beyond the precincts of the station. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c. interfering with the ventilation of the station, &c. 19. The streets of the bazaar are provided with drains, are well ventilated, and there is a sufficient supply of water from the numerous wells. Cleanliness is strictly enforced, and each bazaar has self-supporting public latrines. Every individual shopkeeper is responsible for the cleanliness of his own shop front. The condition of the native houses is generally filthy, dung-heaps being frequent. The existence of cesspools is probable, and pits are common, as in all native towns, villages, and bazaars, these receptacles being kept for all kinds of refuse. There are no native dwellings sufficiently near the barracks to be a cause of nuisance by the wind blowing over them. 20. There are two slaughter-houses in the centre bazaar of the cantonments. One recently erected for the butchers of the station works well, and is clean. It was built out of the bazaar funds, and will repay the outlay in about two years. The fee for killing a bullock is four annas; for a sheep or goat, one anna. What is considered to be offal is almost entirely consumed by the lower orders. The other slaughter-house is the property of the Government meat contractor, and is kept clean, being inspected daily by a commissariat serjeant and occasionally by the commissariat officer. No offal is allowed to remain on the premises. 21. The bazaar horses being very few, are picketed on the owner's premises, and the litter is disposed of for burning bricks. 22. The artillery and cavalry stables are large sheds supported on pillars, light being only admitted from the open sides. Ventilation is effected by means of ventilators in the roof. The stables are situated to the front 100 yards from the barracks, and upwards of 800 yards from the cavalry hospital. There are no dung-heaps, the manure being disposed of in the riding school manége. The picketing grounds are arranged in the immediate vicinity of the stables. 23. The quarters for married non-commissioned officers and men are sufficient. No married people occupy barracks with the men.
Officers' Quarters.	1. Officers do not live in quarters, but occupy well-ventilated houses with gardens and out-offices, in properly drained situations within their respective lines. They are rented from private individuals. No improvement whatever is required.
IV. HEALTH OF THE TROOPS.	1, 2. The station, district, and native population may be considered healthy. The most common diseases among the latter are fever, diarrhœa, dysentery, small-pox, and spleen disease. Cholera is not so frequent here as at other places. 3. The healthiness of the neighbouring native population may be attributed to the porous nature of the soil, to the country being well cultivated, there being fewer sources of malaria, and to free ventilation.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	4. H.M.'s 6th Dragoon Guards arrived here in January 1860 from Mŭttra, where the corps suffered from fever, but since arrival at this station their health has been good. H.M.'s 35th Regiment arrived on the 20th December 1859 from Dinapore, their health there having been indifferent, cholera, dysentery, and fever prevailing among the corps. Since their arrival at this station the health of the regiment has been good, the prevailing diseases being venereal diseases, a few cases of variola, and old cases of hepatitis. The 4th Reg. N. I. came from Noorpore in March 1860. No portion of the men's present accommodation is more unhealthy than the rest. 5. The troops at this station are not camped out. 6 to 9. No experience with troops at hill stations, but soldiers on first going to such stations are liable to be attacked with diarrhœa. 10. No special precautions are required at hill stations with reference to diet, duties, or exercise, but warm clothing is necessary to guard against vicissitudes of temperature. 11. The seasons best adapted for residence in hill stations are the hot and rainy reasons, and the shortest period to obtain benefit from such residence is eight months, or from March to November. 12. I am not aware of any period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service on the plains. 13. No special precautions are required on leaving hill stations for the plains, except to avoid fatigue and exposure to the sun. 14. In my opinion the location of troops on the hills, with short periods of service in the plains, would be the course most conducive to the preservation of the health of troops serving in India. Frequent change of station in the plains is also beneficial to the health and spirits of troops and convalescents, provided the change of stations is effected during the cold season. 15. At Landour the barrack and hospital accommodation appear to be sufficient for the limited number of troops located there. 16. I have no experience to show what ranges of elevation above the level of the sea are most suitable as sites for hill stations. 17. There is no higher ground near this station which could be advantageously occupied as a hill station. 18. A porous surface and a sandy subsoil is the most healthy for stations. Black soil, clay and kunkur beds, whether cropping out to the surface or composing the subsoil, are unhealthy sites. As a general rule, wherever sugar canes grow luxuriantly it may be taken for granted that the soil is healthy. 19. Soldiers proceeding to India should be 22 years of age, and they should land there in the cold season, November, December, and January being the best months. The precautions necessary to preserve the health of recruits on first landing is to prevent them exposing themselves to the sun by day, and the dews and fogs of night and early morning, and to totally prohibit the use of spirituous liquors. Care is also necessary with reference to clothing, as the variation of temperature is very great during the cold season in Calcutta. 23. Troops should be sent direct from the home depôts to India, and as residence on the hills does not acclimatize them for service on the plains, I should recommend recruits being sent to join immediately their respective regiments after landing in Calcutta, while regiments just arrived ought to be stationed in the upper provinces and not in Bengal. 21. Troops are transported to the interior by marching, bullock wain waggons, and by troop boats towed by steamers. 22. A British soldier should serve 12 years in India. 23. Special invaliding boards are composed of five medical officers, and although conflict of opinion is possible, I have never met with any instance of it. 24. Invalids leaving India for home should depart in the cold season, and not later than the end of February.
Diseases.	1. There are regular inspection parades once a week, on Saturday, for the discovery of incipient diseases. 2. Cases of scorbutus occur at the station, but are rare. They do not exceed 1 in every 2,000 admissions, and in the generality of these cases even the disease was contracted elsewhere. It can hardly be attributed to any peculiar cause of local origin. 3. The proportion of admissions from hepatic diseases to all other admissions for three years were 18 per 1,000. The disease was caused by intemperance, exposure, a sequel of cachexia from long residence in India, and from repeated attacks of malarial fever. 4. Dracunculus is of very rare occurrence, and is not of local origin. 5. The proportion of admissions from venereal diseases is about 8 per cent to the total admissions. Lock hospitals would be decidedly advantageous in diminishing this disease, particularly if combined with proper police supervision to provide for the diseased being sent in for treatment. 6. The troops at the station suffer from diseases both of the epidemic and endemic form, viz.:— *Fevers.*—Intermittent, remittent, and continued. *Dysentery.*—Acute and chronic. *Cholera.*—Bilious and spasmodic. *Small-pox.*—Distinct and confluent. *Rheumatism.*—Acute and chronic. The following is the proportion which admissions and deaths from these diseases bear to the the total admissions and deaths :—

Diseases.	Per-centage of Admissions to total Admissions.	Per-centage of Deaths to total Deaths.
Fevers - - -	56·00	25·00
Dysentery - - -	2·75	24·00
Cholera - - -	0·09	0·04
Small-pox - - -	0·09	0·08
Rheumatism - -	3·24	0·04

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	7. The more frequent zymotic diseases are intermittent, remittent, and continued fevers, influenza, small-pox, measles, and cholera. Fevers are most prevalent at the end of the rainy season. Small-pox prevails in March and April, when the atmosphere is in a highly electrical state, indicated by the frequency of dust storms. The other diseases occur at uncertain periods, but great variation of temperature produces influenza, and sometimes cholera. These diseases are most prevalent in the bazaar and native houses, which are dirty, badly drained, ill-ventilated, and crowded. The causes of the prevalence of these diseases among the troops are exposure and intemperance; whilst among the natives insufficient clothing, bad food, and dirty habits are the predisposing conditions. 8. I cannot give a decided opinion as to how far the nature of the soldier's duties and occupations in barracks or habits on the march and in the field influence the prevalence of epidemic disease. 9. Small doses of quinine have not been tried at this station as a prophylactic against malarial disease. 10. I have no recommendations to offer on any of the preceding points towards the prevention or mitigation of epidemic disease at this station.
V. INTEMPERANCE.	1. The soldiers at the station are temperate, the number of confirmed drunkards being very few indeed. 2. The proportion of admissions into hospital from diseases caused directly or indirectly by intemperance is very limited in number, and it would be impossible with any degree of accuracy to prepare a statistical table showing the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at this station. Drunkenness is always punished as an offence. 3. Rum is sold at the canteen. Native spirits are sold in the bazaar, but not to soldiers; they get it, however, smuggled into barracks occasionally. The quantity of Government rum allowed to each man is two drams per diem, on payment, if no beer is drank, or one pint of beer and one dram of rum. Spirit is no part of the soldier's ration, but he is allowed to buy one dram at noon and one after sunset, but never allowed to purchase the two drams together. The effect of spirits upon health depends upon the man's habits. Spirit is never given as a ration to convalescents, but they are sometimes allowed to have beer. No drinks injurious to health otherwise than intoxicating drink are sold in the canteens or bazaar; only tea and coffee are allowed besides. 4. The consumption of spirits is injurious to health, and cannot be said to be conducive either to the efficiency or internal discipline of the corps. 5. The sale of spirits in the bazaars is restricted under severe penalties, but it cannot be altogether abolished. 6. The use of malt liquors and wines would, in my opinion, be less injurious than that of spirits. 7. Tea, coffee, lemonade, and similar drinks are much used at the station, and they are more salubrious in hot climates than spirits or malt liquors. 8. There is no spirit ration either for soldiers or convalescents at this station. 9, 10. It would be beneficial in tropical climates to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, coffee, tea, lemonade, &c. to be sold to the troops. No recommendations on any of these points are offered. 11. By the bazaar regulations a penalty bond is taken from wine and spirit dealers not to sell liquor to British soldiers, and a pass is required, signed by the superintendent, for more than one quart bottle of country liquor leaving the Abkar's premises. Smuggling is punished by fine and imprisonment.
VI. DIET.	1. The ration for European troops consists of—bread, 1 lb.; beef or mutton, 1 lb.; rice, 4 oz.; sugar, $1\frac{3}{4}$ oz.; black tea, $\frac{4}{7}$ oz., or coffee, $1\frac{3}{7}$ oz.; salt, 1 oz.; split firewood, 3 lbs.; and vegetables, 1 lb. Potatoes are supplied when available, otherwise the vegetables consist of such as are procurable in the local markets. An inspection of the rations takes place daily by the regimental authorities and by the medical officer. They are also frequently inspected by the commissariat officer. A daily inspection is made by the commissariat officer at the ration stands, and the bakery, slaughter-house, and cattle are viewed every day by the commissariat serjeant. 2. Fruit is not issued to troops, only to the hospitals when sanctioned. The stoppage for rations is 3 annas 4 pie, while the cost to the Government is 8 annas. The proportion of vegetables entering into the constitution of a ration is 1 lb. per man per diem. 3. No improvement is required in the ration, nor has it been found necessary to adopt any measures for preventing the disposal of the ration by the troops. 4. Native cooks are employed to cook the rations, the cooking being performed in copper and iron vessels served out by the Commissariat Department. The copper vessels are tinned monthly. The kitchens are clean, light, and well ventilated, and sufficiently supplied with water. The food is boiled or roasted in turn, and the cooking is properly and sufficiently varied. Tea and coffee is also properly prepared for the men. It depends on regimental arrangement whether the men have tea or coffee before a march, but it is now becoming a general thing to do so. 5. Soldiers' gardens for the cultivation of vegetables would be advantageous if there was ground near the barracks, as the men could not be expected to go far to work at them.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress and accoutrements at the station consist of a basket helmet, coat, trowsers, *no stock*, waist-belt, one shoulder-belt for pouch, ammunition, and boots. This dress is very well adapted for the climate and for the soldier's duties by day and night, and at different seasons. The men's kits are now well adapted to meet all vicissitudes of seasons. In the wet weather he has his cloak, and sentries are never exposed to the sun.
Duties	1. It would be a great advantage if the men came out ready drilled from home, particularly for the mounted branches of the service in India. 2. The routine of a soldier's duties is drill morning and evening for an hour or an hour and a half during the cold season, which does not affect their health. The best hours for drills in the cold season is up to 10 o'clock in the morning and after 4 p.m. In the hot season they should take place before 6 or half-past 6 a.m., and after 5 p.m. Only general instructions are issued under this head; there are no general orders on the subject. The average

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*Duties—cont.*	number of nights the men have in bed during the week varies: At present they have 14 nights in bed without mounting guard. 3. Guards are mounted close to the barracks, and relieved daily. Roll calls take place morning and evening, and at night when circumstances require it, which is rarely the case.
VIII. Instruction and Recreation.	1. The means of instruction and recreation are as follows:—There are balls courts, covered in skittle grounds, schools with good schoolmasters, and a theatre. Neither library, day-room, or soldiers' clubs, soldiers' gardens, workshops, or gymnasia exist at the station, and the present means are not sufficient to keep the men occupied during the wet season or heat of the day. The men are strictly prohibited from going out from 8 a.m. to half-past 4 p.m. during the hot weather, but there is less restriction in the cold season, and with the best possible results. 2. In order to improve the existing means of recreation and instruction I would recommend in-door employment of the men, if possible, in their several trades, and the erection of a gymnasia of approved construction. 3. Savings' banks are already in existence, and are attended with the best results possible especially to married men. 4. The shade from trees, verandahs, &c., is very limited, and quite insufficient to enable the men to take exercise without injury during the day.
IX. Military Prisons.	1. The sanitary state of the prison cells is good with respect to space and ventilation, but they are defective as regards temperature, which could, however, be advantageously lowered by tatties and punkahs.
X. Field Service.	1. There are no local regulations for field medical service not included in the General Presidency Medical Regulations. 2. With regard to the practical working of the powers of medical officers as regards the conduct of the line of march of troops, bivouacking, camping, &c., the commanding officers generally are glad to avail themselves of any sanitary suggestions made by medical officers in the positions noted. 3. The medical officers make sanitary recommendations in reference to the selection of camping grounds, general sanitary regulations, &c., which, when carried out, are attended with the best results. 4. No reply to this query.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1, 2. The hospitals are situated at convenient and proper distances from the barracks. The stables to the north-east are about 800 yards distant, and those to the north-west about the same distance. They are situated to the north of the bazaar and civil population, the sites being open, freely ventilated, and healthy as to elevation, drainage, and absence from malaria from all sources. 3. The water supply is abundant and wholesome. 4. The means employed for draining, removing refuse water and other impurities from the hospital are wide open masonry drains, gradually increasing in depth. There are two outlets, one about 1,700 feet from the hospital into a tank, and the other about 5,000 feet distant into a nullah, the water of which flows readily away, and is dry in the cold season and hot weather. 5. The height of the lowest wards above the ground is from one to two feet, but there is no perflation of air underneath. Not required; no dampness. The roof water is partly carried away and partly sinks into the subsoil. The surface drainage and guttering round the hospitals is good, and quite sufficient for carrying away the rain-fall rapidly. The hospitals are built of brick and mortar, with single tiled roofs over grass thatch. The walls and roofs are sufficiently thick to keep the buildings cool. The hospitals have verandahs all round, some of them being double. They are 10 feet broad, and afford sufficient shelter from the sun's rays. The single verandahs are never used for the accommodation of the sick or others, but in double verandahs the inner one is so used in cases of emergency. The hospitals consist of one flat only.

Table of Hospital Accommodation.

Date of construction.—1810, 1811, 1830, 1845, 1846, and 1856.

Total number of wards, 4.

Total regulation number of beds, 428.

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
Meerut. European Cavalry.											
1 hospital	104	298½	25	20	149,250	1,435 10/104	71 78/104	1⅝	1	4	3
Artillery Division.											
1 hospital	100	295	25	22	162,250	1,622½	78¼	1¾	1	4	3
European Infantry.											
1 hospital	160	434½	25	15½	168,368¾	1,052 48/100	67	1½	1	6	4
1 detached do.	64	174	25	15½	67,425	1,053 33/64	68 1/64	1½	1	6	4

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References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The hospital receives the full benefit of the prevailing winds. The windows are glass doors opening inwards, and are conducive to ventilation and coolness. 6. Ventilation in the wards is effected by means of doors, windows, and circular holes in the side walls. The ventilation from the roof also is ample. There are no jhilmils, but there are chicks to keep out the flies, and quilted cotton purdahs for the cold season. 7. Screens of kus-kus grass are fixed on the doorways and kept wet to cool the air admitted into the wards, and besides these artificial cool currents of air are established by means of thermantidotes or blowers. 8. No means exist for warming the wards. The walls and ceilings of hospitals are cleansed and limewashed annually, or whenever the medical officer thinks fit. 2. The privies and urinals adjoin the hospital, and are connected with it by a covered passage. They are permanent buildings of burnt brick and lime mortar. They are properly drained and supplied with water, the soil being removed in pans and by filth carts, as in barracks. The urinary has a cesspool with a covered top attached. These out-offices are not offensive. 10. The lavatory arrangements are the same as for barracks (par. 12, Sanitary Condition of Station), and are quite sufficient for the purpose. 11. In the lavatory there is a bath for the sick, which is both sufficient and convenient. 12. The washing and drying of hospital linen is efficiently performed by native washermen at a distance from the hospital. 13. The storage is sufficient and dry. 14. The bedsteads used in hospital are of wood, some having laced canvass bottoms and some with two-inch tape. The bedding consists of a mattress stuffed with hemp, sheets and blankets, covered with chintz. I would suggest that iron bedsteads be substituted for wooden ones. 15. The hospital kitchens are detached buildings, but situated close to the hospitals. The means and apparatus for cooking are those in common use, viz., metal cooking pots on native grates, which are sufficient for the purpose. Diets are properly cooked, and can be varied to any extent. 16. Copies of diet tables, diet rolls, separate statements, &c. &c., will be found in the Bengal Medical Regulations, 1851. 17. One hospital serjeant is attached to each hospital, and the sick are attended by a native establishment sufficient for the purpose. There are no nurses, but orderlies are employed in special cases as required by the medical officer. There are female native attendants for female hospitals. 18, 19. The sanitary condition of the hospitals is excellent, and no epidemic disease, hospital gangrene, or pyænia have ever appeared in the wards. No improvements are suggested. 20. Convalescents go out for an airing on elephants and in doolies. There is also sufficient ground about the hospitals for them to take exercise, and there are seats with backs in the outer verandah. 21. There are separate female hospitals for the treatment of soldiers' sick wives and children, the arrangements in which are satisfactory. 22. There are no special local hospital regulations enforced at the station which are not included in the General Presidency Medical Regulations. 23. The medical officer has full power in all matters appertaining to the sanitary condition of the hospital, medical comforts, change of diets, &c. 24. There are no convalescent wards or hospital, but a convalescent ward attached to each hospital would be an advantage.
XIII. BURIAL OF THE DEAD.	1. The burial ground for the use of British troops is to the north of the station and about 400 yds. from the nearest barrack. The prevailing winds are westerly, and consequently out of the direct track of the station. 2. Its area is about 56,000 sq. yds., the subsoil being sandy; the drainage is excellent. The ground is carefully kept. 3. The grave space allowed is 2½ ft. in width, with an interval between each grave of 2 ft. The depth is 4½ feet below the surface. If the graves are of earth, they are never re-opened, but brick graves are occasionally opened. These, however, have seldom or never more than two bodies buried in them. Interment is compulsory at ordinary times within 12 hours after death, and during epidemics often in less than 6 hours after decease. 4. The graveyard has never been known to be offensive, being well watched by Government servants for that express purpose, and hence no nuisances have been committed. The British soldiers' burial is regulated by the medical officers of regiments; as a rule those who die in the morning are buried the same day at sunset, and those who die in the evening about sunrise next morning. 5. The dead of camp followers or bazaar people are disposed of according to caste. Their relations or the police either burn them or bury them at some distance from the station. 6, 7. No injury accrues to the public health by the present practice, and no improvements in the disposal of the dead can be suggested.

(Signed) J. WILKIE, M.D., Deputy Inspector-General of Hospitals, Meerut Circle.
G.H. SWINLEY, Colonel, Commanding the Station.
F. ALEXANDER, Captain, Offs. Exve. Engineer, Meerut Division.

21st May 1860.

MUTTRA.

Accommodation.—European Troops - - { Artillery - - 100 / Cavalry - - - 300

References to Subjects and Queries.	Replies.
I. Topography.	1. The country round the station is open, flat, sandy and dry. A ridge which is the right bank of the old bed of the Jumna, runs in a crescent shape round the cantonment at about ¾ of a mile distant. The arc is about 8 miles long, and it terminates in a marsh at Bād. There is no wood nor jungle of any size in the vicinity. The river Jumna passes close to the station, many of the officers houses being situated on its banks. There is no other running water near. During the rains the river overflows the country, extensively on the opposite side, and to some extent on this side, leaving as it subsides an extensive alluvial deposit. 2. The height of the station above the sea is not known. The greater part of it is lower than the surrounding country. Besides the river Jumna there are two marshes, one at Māth, 6 miles west, and one at Bād, 6 miles east. There is a large nullah close in rear of artillery lines, and numerous small nullahs all over the station. The ridge mentioned above affords higher and healthier ground for a station, about 2 miles south of the present station. This ridge expands into a fine open plain, about 30 feet higher than the present station, with an ample fall for drainage on every side. It is well away from river and city. Surface sandy, subsoil kunkur (limestone nodules). It has been pronounced by two committees to be the proper site for this station. 3. The nearest range of hills is 70 miles distant near Deig, commencing near Delhi, and running is a S.E. direction into Central India. Probable height, 2,000 feet. 4. The station is partly bounded on the east by the Jumna, and partly on the N.W. by a deep nullah, which is dry except during rains, when the river suddenly rises; the nullahs become choked by back water from it, and as a consequence the low lying ground is overflowed, especially the plain to the S.E. of the cavalry lines. Last year this occurred only once and lasted 12 hours, when the flood began to drain off. The station and its vicinity is full of broken ground, and nullahs that carry off the surface drainage of the country. In part, the cantonments are built in the confluence of them, and during the dry season they are receptacles of all manner of filth. There is also a large excavation, say 200 yards square, about 400 yards south-west of cavalry barracks, which is full of water during the rains, but is now dry and fissured. It is close to two brick-kilns, and the clay for them is taken out of it. All this must be very injurious to health. 5. The station is encumbered with trees, interfering with ventilation, and the large filthy city of Muttra is on the N.W., from whence the hot wind blows, and on all sides it is surrounded by higher country. The temperature of the buildings is considerably raised by their being exposed to reflected sun heat. The station is not more exposed to winds than other inland stations. 6. The surrounding country is cultivated, but the land on this side the river being poor, only the hardiest crops are sown. Across the river the land is rich and bears all kinds of grain. There are no works of irrigation near the station. Water is obtained for the ground from wells. The quantity used is not excessive nor injurious to health. The country is not a rice country, and neither hemp, flax, nor indigo are cultivated. 7. The large city of Muttra is three-quarters of a mile distant. 8. The surface of the ground occupied by the station is sandy. The subsoil is kunkur (nodules of limestone). The officers lines are those which have been occupied during the last 50 years by the officers of native cavalry regiments, and the barracks are built on the site of the old native lines or huts. 9. During the dry season water is found at 15 or 20 feet below the surface. The depth to which it rises in the rainy season is not known. 10. Water lies on the surface until it evaporates to the front of Artillery Park, and on one or two places near the Delhi road, also between cavalry and artillery lines, and in several parts of the nullah to rear of the artillery. Water runs freely off the remainder of the station. The drainage from the ridge around the station passes through the station en route to the river. 11. The water supply of the station is derived from wells. It is not stored in tanks. 12. Any amount of water is available from the river, and also from numerous wells. In the west of the city and in the Sudder bazaar the wells contain large quantities of sulphureted hydrogen. This is, I believe, owing to their low situation, and consequent imperfect surface drainage. The natives drink the water from these wells, and do not appear to suffer from it. In the station some of the wells contain good, clear, wholesome water, whilst others perhaps close to them are impregnated with salts, and are avoided by the natives as causing eczema and other skin diseases. There is abundance of good water from the pure wells. The others are known and easily avoided. Water is raised and distributed for use by ropes and leather buckets, partly by manual labour and partly by bullocks. It is quite good enough. 13. No other topographical points require to be stated. 14. New stations are selected by a committee of two military, one civil, two medical, and one engineer officer. As far as my experience goes in the plains (I know nothing of the hills), the examination is a very superficial one, and I never heard of a committee being called to account for a careless selection, although there are but too many instances of such all over the country; this station for instance. I would insist on the committee stating in their report the number of miles they had travelled round the proposed site; the number of hours they had been so employed; the number of villages they had examined; their condition as regards the health of the inhabitants; the number of inhabitants subjected to medical examination, and the results; and I would hold the committee severally responsible for any glaring oversight. If there should be no wells on the proposed site, one or two ought to be sunk to ascertain the quality of the water before it is finally fixed upon.

MUTTRA. BENGAL.

References to Subjects and Queries.	REPLIES.
II. CLIMATE.	1, 2. There are no meteorological instruments nor records at the station. 3. With regard to the climate, since I have been at the station (I arrived in January last) there has hardly been a drop of rain. During January, February, and March, high westerly and northerly winds prevailed. There has been neither fog nor damp, nor excessive cold. It is now excessively hot. *Lowest* range of a thermometer in a good house, 93° F. In the hospital it is seldom below 98° F., and in the barracks much higher. There is neither tree, planting, nor canal irrigation to affect the climate. Just now the air over the entire district is a mass of dust, sometimes obscuring the sun even. But this is the normal state of the plains of India before the rains. The climate produces heat apoplexy, hepatitis, and continued fever. As a precautionary measure the men ought to be confined strictly to barracks, or under a good roof from 8 a.m. till sunset. Their diet ought to be lighter, less meat, light puddings, and plenty of fruit and vegetables being substituted for it. At this season of the year there cannot be too little drill. The most healthy months at the station are from October to March inclusive, and the amount of sickness is pretty equal and moderate. April and May are the sickliest months; continued fever and hepatitis being the prevailing diseases. 4. The healthiest adjacent district is that already described. The drainage is natural and the water supply would be from wells. As an illustration of the influence of elevation in the present station, the artillery are higher than the cavalry, and the sickness per cent. in the latter is more than 5½ times as great as that of the former; and the mortality is 2·38 per cent. to 0·99. As the whole station is low and in every way faulty in situation, the change could not be otherwise than advantageous. I know of no reason against its adoption, save the necessity of abandoning the cavalry temporary barracks, and the artillery antiquated permanent ones. 5. As regards the comparative healthiness of other stations at which I have served:—In 1842 the rice fields of China became unhealthy, when, owing to the irrigation being stopped, the land began to dry up and fissure. As long as the fields were under water there was but little sickness. *Berhampore* in 1843:—Station lower than the river: covered with tanks, bounded on one side by the river Hoogly, and on the other by extensive swamps; it was a very deadly place for Europeans: principal disease, remittent fever. *Benares* and *Ghazepore* in 1844; the former inland, sandy soil, and very healthy; the latter on banks of river, stiff clay soil, and that year very deadly: principal diseases, cholera and remittent fever. *Shahjehanpore*, all 1845 healthy. City of *Lahore*, first half of 1846, bad accommodation. City filthy and drainage very defective. Very sickly; remittent and intermittent fever, bowel complaints, large boils, and hospital gangrene prevailed. *Loodiana*, 1847:—Sandy soil, open country, was then healthy. *Moherim* (Jullundur Doab) 1848–49:—Open country; station on rising ground; soil sandy; subsoil boulders; very healthy. *Peshawur*, from December 1849 to July 1858:—Station on lowest part of the valley, with an extensive marsh close to it. Soil, stiff yellow clay, without a particle of sand in it. The entire valley extensively irrigated by large rivers and canals, and the station itself too freely irrigated by canals. The station was very unhealthy, but since a belt of trees has sprung up between it and the marsh, a decided improvement has taken place. Principal diseases, continued, remittent, and intermittent fevers, hepatic complaints, bowel complaints, and heat apoplexy. *Meerut*, 1859:—Sandy soil, tolerably healthy. *Muttra*, since January 1860:—Sandy soil, tolerably healthy, and with a proper site would, I believe, be remarkably so.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Plan of station and barracks. Artillery barracks constructed previous to the mutiny; cavalry barracks in 1859–60. 4. The following table gives the accommodation:—

	Regulation Number of Men.	Dimensions of Barrack Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area of Floor Space per Man.	Height of Beds above Floor.	Windows. Number.	Height.	Width.
European Artillery.		Ft.	Ft.	Ft.	Ft.		Ft.	Ft.			
No. 1 Barrack	40	106	24	16	40,704	1,000	60	—	12	6	4½
„ 2 „	40	106	24	16	40,704	1,000	60	—	12	6	4½
„ 3 „	40	106	24	21	53,404	1,335	60	—	22	6	4½
„ 4 „	40	120	24	16	46,080	1,152	72	—	„	„	„
European Cavalry.											
No. 1 Barrack	104	325	24	21	163,800	1,575	75	—	20	6	4½
„ 2 „	80	246	24	19	112,176	1,402	73·8	—	no windows. arched doorways		
„ 3 „	80	246	24	19	112,176	1,402	73·8	—			
Guard Room.											
Artillery	16	30	18*								
Cavalry	16	44	13*								

* Two end rooms besides to each Guard-room.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The barrack-room windows are on opposite sides; hung on hinges, opening at the centre inwards. There are inner verandahs to each barrack 8 feet wide and 12 feet high. The verandahs are not used as sleeping places. There are no jalousies. 6. Ordinary cots with twine bottoms are used for barrack bedsteads. In tents on the march men are supposed to have dry straw to spread their bedding on, but the allowance for its purchase, 8 annas a day per troop or company, is so small that the men usually have to go without it, and spread their carpets on the bare ground. Such was the case when this regiment marched here. To remedy this, allow a certain weight of straw per troop or company, without respect to its price, which varies much. The barrack bedding consists of a cotton lined quilt, a blanket, two sheets, and a small carpet. 7. Tents are constructed with double poles and double roofs, with a space of 12 inches between them. Tents are made of cotton canvass; they are 10 feet high to the ridge poles. The side walls are 5¼ feet high; they are 21 feet long and 18 feet wide. Cubic space per man 180 feet. Superficial area per man 23⅝ feet. Each tent holds 16 men. 8. Barracks and guard rooms are ventilated by saddles carried along the ridges their entire length. The only means of ventilating tents is by throwing the doors open. These means of ventilation are not sufficient for any of them by night. In tents, where the doors are closed during dust storms or very cold weather, there is no ventilation. Tatties made of kus kus, a scented fibrous root, and costing 8 rupees each, are used for cooling the air. 9. The materials used for constructing barracks are chiefly unburnt bricks and cement. 10. Various materials are used for flooring. Nos. 2 and 3 barracks in the European cavalry lines have lately had their floors raised two feet above the level of the ground, and a flooring given of stone slabs 1½ inches thick over two courses of burnt brick. No passage of air beneath. 11. The materials and construction are tolerably suitable. The barracks might be better ventilated by having a row of small windows just below the eaves of the roof; they should be hung on pivot hinges, and opened and closed by pullies and ropes. The ventilation of tents is a more difficult question; they might, however, be ventilated by means of canvass tubes, something like wind sails on board ship suspended from the ridge poles, and passing through the inner roof down into the tent; the upper mouth of the tube should open between the roofs where there is almost always a draught of air. In executing repairs of barracks, mason's work is promptly done by the executive engineer. Minor repairs to doors, windows, &c. are done by the barrack master or serjeant, not very promptly. The senior medical officer is supposed to be responsible for the general sanitary state, but he can only represent, and his representations are frequently attended to very tardily. The walls are swept down once a fortnight, and limewashed once a year, or oftener, if recommended by the medical officer. 12. The lavatories, three in number, are only temporary sheds built on poles (what is commonly styled wattle and dab), and there is one plunge bath of similar construction, only lighted and ventilated by the doors. 13. The cook-houses are of masonry with tiled roofs. Copper cooking vessels, iron roasting spits, water supplied by water carriers. Refuse water collected in reservoirs and carried away by hand. Linen is taken to the river, washed there, and dried in the sun. It is the usual plan in India, and answers very well. 14. The privies are merely tiled sheds. The contents are removed by mehters. 15. The outbuildings, except the cook-houses, which have grated windows, are only lighted and ventilated by the doors. Barracks lighted at night by oil lamps, four per troop. 16. The drainage arrangements consist of temporary drains varying from 1½ to 4½ feet deep. They are quite sufficient for readily conveying away surface water. The drainage from lavatories, baths, and wash-houses, fluids from cook-houses, privies, and urinals, are carted away in vessels. There is no part of the barracks damp. There are no cesspits. 17. As regards surface cleansing, about the barracks the surface is kept tolerably clean. It is swept twice daily, and the refuse, &c. is taken to the brick-kilns. But in the officers' lines sweeping is unknown, and the roads and compounds are very filthy. 18. Of late the surface of the cantonment has been kept free of vegetation. The station is full of old walls of dwelling-houses and outhouses, destroyed during the mutiny, which ought to be removed. 19. The bazaar is an accumulation of huts without any attempt at order. The drainage is bad; the ventilation worse; water supply execrable. All the wells are brackish from nitre oozing into them from the surrounding earth, which is contaminated with all sorts of impurities, tanners' refuse included, as a host of these people carry on their trade in the midst of the bazaar. Latrines are hardly known. In short the bazaar is a mass of filth. The bazaar is in charge of a native Kutwale, but his means are inadequate for enforcing cleanliness. Indeed I do not see how cleanliness could be enforced in such a place. It ought to be razed to the ground, and a new one properly laid out, built on a new site. There are not any native houses nearer than this bazaar. There is no nuisance from winds blowing over native dwellings. 20. Cattle are slaughtered not 200 yards N.W. from artillery barracks. No regulations. Offal taken away. No nuisance experienced. 21. Horses are picketed in rear of the bazaars on sloping ground, about 400 yards from the nearest barrack. The manure is sold or burnt. 22. The stables of the station consist of open sheds on brick pillars, tiled roofs. Cavalry stables due west, not more than 100 yards distant, and about 120 yards south-west of hospital. Artillery stables are 200 yards north of barracks and hospital. No ventilation in the roofs of any of them. There are no dung-heaps; the manure is burnt in brick kilns hard by, or used for riding-school, and for exercising ground for sick horses. Picketing grounds are close to the stables. 23. The married quarters are sufficient for married non-commissioned officers. Married men of cavalry occupy old cavalry barracks on bank of river. They do not occupy barrack-rooms with the men. In the artillery, married people occupy barrack-rooms with the men.

MUTTRA.
BENGAL.

References to Subjects and Queries.	REPLIES.
Officers' Quarters.	1. Cavalry officers' quarters are between barracks and river, amongst the confluences of the ravines described above. In the heart of them are situated two burial grounds, one Christian and one Mohammedan. The artillery officers' quarters are between the barracks and the filthy Sudder bazaar, close to the latter on low raviny ground, and the roads and enclosures of both are in a filthy neglected state. Both burial grounds ought to be closed up, cleanliness enforced, and all ruined houses levelled.
IV. HEALTH OF TROOPS.	1. The station has only been re-occupied for a year. The artillery have been healthy; the cavalry not so. District is healthy, and the villagers living on the banks of the marshes, not 100 yards from them, are healthy, and spleen disease is rare amongst them. 2. During the months of March, April, May, and December, small-pox rages in the city, which is very filthy, and there is great mortality amongst children. 3. Sandy soil, open country, and freedom from excessive irrigation, are causes of healthiness of the district. Dirt, crowding, and the absence of all precautions against spread of contagion, are causes of the great prevalence of small-pox in the city. 4. The following stations were occupied by the troops before coming here:— *Cavalry.* Meerut, 16 months. Left, December 28th 1859. Their health there was tolerable. Fever, bowel and hepatic complaints were the principal diseases. Health good on arrival here on January 8th, 1860. Ephemeral fevers and venereal complaints the principal diseases since arrival. *Artillery.* Bareilly, 4 months. Left, October 10th 1848. (Query 1858.) Health there, indifferent. Arrived here, 3rd April 1859. Good health. Chiefly intermittent fever since arrival. The cavalry lines here are more unhealthy than the artillery, from their lower position. 5. Troops are not camped out at this station. 6, 7. No experience. 8. I approve of hill stations for troops. 9, 10. No experience. 11. The best period for residence at hill stations is from April to the end of November. A three years' residence at such stations would enable troops to derive the most benefit from them. 12, 13. Not aware of any period of residence at hill stations beyond which troops would be more exposed to disease on returning to the plains, nor of any precautions being required on returning. 14. With reference to the best manner of combining the advantages of hill stations with service in the plains, I am decidedly in favour of locating troops on hill stations, with short periods of service in the plains. As regards change of station in the plains, if the station be a healthy one, it does not conduce either to the health or happiness of the troops to remove them quickly. With an unhealthy station, as a general rule, the converse holds good. I say as a general rule, because in some malarious climates, Peshawur, for example, I believe the troops become acclimatized and reconciled to them. 15, 16. No experience. 17. There is no ground for a hill station near Muttra. 18. The most healthy stations I have been at have had sandy surfaces, but I cannot say what the subsoil of all of them was. One of the healthiest had flint boulders, and this station has kunkur (limestone nodules). 19. The best age for soldiers proceeding to India is between 20 and 30, and the best period for arriving in India is early in October. They should be sent at once up country, or (20) to the hills. 21. Troops are transported to the interior by railway, bullock train, and river. Marching would be preferable, say 12 miles a day. According to the present system, the men are frequently sent up country in small detachments; they sometimes travel *day and night during the hottest weather;* sometimes without any medical aid, and sometimes in charge of a hospital apprentice of *three months' standing.* Many of my fatal cases last year were attributable to this cause solely, namely, to exposure and want of proper treatment. 22. I consider from 12 to 15 years as the period a British soldier should serve in India. 23. In my experience I have found medical boards anxious to act conscientiously, and when there has been a difference of opinion, the majority decided. 24. February is the most desirable month for invalids to leave India for home.
Diseases.	1. There are health inspections every alternate Saturday for cavalry, none for artillery. 2. There is no scorbutus. 3. The proportion of hepatic disease usually under treatment is about 2·84 per cent. of the admissions. On the accession of hot weather it becomes much greater. This, I believe, is owing to the excretory functions, particularly those of the skin, not having adapted themselves to the sudden change; for although the heat increases their affections do not increase with it. Thus, in May 1859, the proportion per cent. of hepatic affections to all admissions was 10·31; in June, 3·49; and in July, 3·29. The majority of acute hepatic affections are, I believe, idiopathic. Though doubtless some depend on obstinate or neglected cases of remittent and intermittent fever, inducing congestion, &c. The prophylactic measures are avoiding direct solar exposure, guarding against chills at night by wearing flannel belts, and other appropriate clothing, and cutting short these fevers by active treatment. 4. No experience. 5. The proportion of constantly sick from venereal disease to the sick from other diseases is 14·10 per cent. or 1 in 7·5. To diminish this evil, no cantonment ought to be nearer than four miles to a city, for as long as the men have access to one no precaution will preserve them from infection. Make them dependent on the cantonment bazaar, and then, I believe, lock hospitals would be highly advantageous. 6. As regards the occurrence of epidemic disease, the station has only been re-occupied for a year, and there have been no diseases among the troops of an epidemic or endemic nature. Cases of fever which have occurred are such as are met with all over India. The proportion of admissions from these diseases to the total admissions have been, fever common continued, 1 in 52·8; intermittent, 1 in 6·6; dysentery, 1 in 6·6; cholera, none; small pox, 1 in 155; rheumatism, 1 in 17·6. From all of them the admissions have been 1 in 3·7 of the admissions, and there have been no deaths.

References to Subjects and Queries.	Replies.
V. Health of the Troops: *Diseases—cont.*	7. No information, except that the city is very filthy, and that small-pox prevails in it in March, April, May, and December. 8. No information. 9. Quinine has not been tried as a prophylactic at this station. 10. For the prevention or mitigation of epidemic disease at this station, enforce strict cleanliness throughout cantonments, including officers' compounds; close the present graveyards, and have others outside cantonments; establish an efficient sanitary police in the bazaars, or, better than all, remove the station while you can, *i.e.*, before permanent buildings have been erected, to an eligible site, for a reference to the topography of the station ought to convince any one that one worse than the present could not possibly have been selected; and if a new site should be determined upon, make the engineer forfeit his commission if he places a single brick or lime kiln within two miles of the boundary pillars. When a new station has been decided on, the first thing an engineer does is to commence to burn his bricks, and to save the expense of carriage he places his kilns as near to his work as practicable. By-and-bye when the kilns have been well lighted, the community is surprised at their noxious exhalations. Stable litter, the bones of dead animals, such as horses, camels, elephants, and dried ordure, human included, being the ordinary fuel used in them. The engineer is appealed to, but he pleads, and generally successfully, the loss to Government, and the delay in the construction of the barracks, their removal would entail, and so they are allowed to remain, poisoning the cantonment. At Peshawur, they thus burnt all round cantonments for 7½ years, and it is worthy of remark, that since they were allowed to burn out in 1857, the health of the troops there has considerably improved. Whilst I am now writing, the smell from the kilns at this station is very disagreeable; but it is during the cool still night that it is most intense, often entailing the necessity of closing the doors to keep out the abomination.
V. Intemperance.	1. The artillery soldiers at the station are very intemperate, the cavalry temperate. About 10 per cent. in the artillery are confirmed drunkards. There are no confirmed drunkards in the cavalry. 2. One in 91·5 of the admissions into hospital are caused directly by intemperance, none indirectly. There are no materials for a statistical table on this subject. Drunkenness is punished as an offence. 3. Spirits are sold in the canteen, and also in the bazaar, surreptitiously. Two drams of rum, 24 per cent. under London proof, may be had at the canteen. Any amount of bazaar spirits is obtainable. Spirits form no part of the soldier's ration, except on occasions of extraordinary exertion, such as sometimes occur on active service. No spirits are sold in canteen before dinner. They are seldom given as a ration to convalescents, except to confirmed drunkards; if any, it is brandy, from four to six ounces. No other drinks injurious to health are sold in the canteen or bazaar. 4. The consumption of spirits is not as a general rule conducive to health, but at times it is absolutely necessary for convalescents. It is not conducive to discipline, but it would not do to withhold it from men long accustomed to its use. 5. It would be beneficial to abolish the use and sale of spirits; but it is a measure that should be gradually introduced, for there are many confirmed dram drinkers who would not exist without it. Prohibit its use to all men under 30 years of age, and to all men who may *hereafter* arrive in the country under 30 years of age. 6. Malt liquor and wine are decidedly the best for men who have not been long used to spirits. 7. Coffee, tea, lemonade, and similar drinks are much used at the station. I consider their influence good as auxiliaries to malt liquors. 8. It would be beneficial to suppress altogether the spirit ration, but for reasons before assigned, it ought to be done gradually. 9. It would be beneficial to permit only beer, coffee, tea, lemonade, &c., to be sold to the troops, except in the case of men long used to spirits. 10. I have no recommendations to make on these points. 11. There are no canteen or bazaar regulations. Only beer and spirits are allowed to be sold.
VI. Diet.	1. There are no Queen's British troops at the station. For the European troops in the Indian army the ration is— 1 lb. bread; 1 lb. meat, generally beef; 4 oz. rice; 2⅔ oz. sugar; ⅔ oz. of tea, or double that quantity of coffee, alternately; 1 oz. salt; 1 lb. vegetables; 3 lbs. firewood. Mutton is substituted for beef occasionally. The ration is inspected by the orderly officer and quartermaster. 2. A complete ration is provided at 3 annas 4 pice, and, in addition, the men mostly pay 1 anna each a day for extra necessaries. They have three meals: breakfast of tea or coffee, bread and rice, at 8 a.m.; dinner of meat, soup, and vegetables, at noon; and supper of tea or coffee and bread, in the evening. 1 lb. of the vegetables of the season are included in the ration. 3. It would be beneficial to reduce the quantity of meat during the hot weather, substituting light puddings, fruit, &c. There is no arrangement for preventing any part of the rations being disposed of. 4. There is a cookhouse to each troop, supplied with a certain number of copper cooking pots, &c. The kitchens are clean, and inspected daily by the orderly officer. They are badly lighted and ventilated. There is plenty of water. Food can be boiled, baked, stewed, and roasted. The cooking is tolerably done; but there is great difficulty in procuring good cooks at this station. The men have no refreshment before the march, but half way the regiment is halted, and coffee and biscuits are ready. 5. Very few of the men would work in gardens, unless Government insisted on their supplying themselves with vegetables, and then potatoes, their staple vegetable, cannot be grown at many stations, Peshawur, for instance. These gardens should be under a regimental, station, or bazaar committee.

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References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of jacket, a tunic, and overalls of cloth and cotton, according to season, with the usual accoutrements. The dress is suitable to the climate and duties. No suggestions as to improvement.
Duties.	1. Men should, most decidedly, be thoroughly drilled at home before being sent to India, especially mounted soldiers. 2. The usual routine of duties is one hour in the morning five times a week, and one hour in the evening at either drill or stables four times a week. Trained soldiers do not suffer from this, but recruits suffer much. The best remedy is to drill them at home. Daybreak and sunset are the best times for drills and parades during the hot weather. For marches, the men ought to arrive on their new ground by sunrise in hot weather. The men have usually four or five nights per week in bed. 3. Guards are mounted close to the barracks. They last 24 hours. Sentries relieved every second hour. There are check calls every hour from 9 a.m. to 5 p.m. during the hot weather, in order to keep the men from roaming about in the sun. Roll calls at watch setting, at 9 p.m. No roll calls by night. The night guards, with proper precautions as to clothing, *i.e.*, that the men are not too warmly nor too coolly clad, are not injurious to health.
VIII. Instruction and Recreation.	1. At this station there are neither ball courts, skittle grounds, schools, library, reading room, nor day room. The two first proposed, but not decided on. There are no workshops, theatre, nor gymnasium. There is one soldier's garden for the artillery, but there are no European garden tools, although indented for a year ago, and the men cannot use the native tools. There are hence no means of instruction or amusement. 2. To supply means of occupation, establish commodious well-lighted and ventilated workshops provided with ordinary turning lathes, carpenters and other tools, and encourage the men by purchasing their work at a fair price. Work of this kind is in great demand, as is also saddlery, cooper's work, &c., and as European workmanship is confessedly superior to native, the state would be doubly benefited by thus employing the men; first as regards the health and morals of the men, and next as obtaining more durable work. 3. I am not prepared to say whether savings banks would be beneficial; their establishment has been ordered, however. 4. There is not sufficient shade at the station to enable men to take exercise during the heat of the day without injury to health.
IX. Military Prisons.	1. The prison consists of four cells, about 14 feet square and 12 feet high, arranged in pairs, and entered from a common passage. They are ventilated by loop holes about 9 feet above the ground. There is no verandah round the building, which being of burnt bricks laid in lime cement, and faced with white lime cement, absorbs the heat and renders the place uninhabitable during the hot months. A new one on improved principles has been sanctioned for the cavalry, but its construction is in abeyance, pending a reference for a new site for the station.
X. Field Service.	1. I have no local regulations on this head. 2. I have never been consulted on the conduct of the line of march, bivouacking, camping, &c. 3. The usual practice is that the quartermaster goes ahead and selects the camping ground. I know of no general sanitary regulations on this head. There is generally an abundance of water. The medical officer has no power in these matters, and he would lay himself open to a rebuke if he interfered. I have known a superintending surgeon to be most severely reprimanded by a general officer for presuming to remonstate against his sending a party of soldiers as *a sanitary experiment* from one station to another, distant 100 miles at the hottest time of the year. Give the medical officer power in these matters, and when his services can be spared, let a medical officer go ahead with the quartermaster to select camping ground, and let him have power to enforce the selection. 4. No information.
XI. Statistics of Sickness and Mortality.	1. No information.
XII. Hospitals.	1. Plans. 2. The new female hospital is used as a male one for cavalry. It is due north (nearly) of the barracks, and distant 200 yards from them, and 400 yards from the stables. The artillery hospital is close to the barracks, distant about 30 yards from them and 200 yards from the stables. Both hospitals are some distance (say 400 yards) from any bazaar or non-military dwelling. The cavalry site is well open and freely ventilated. The artillery not so well off, being too near the city. The site of the cavalry hospital is the highest spot in their lines, much higher than any of their barracks. It is well drained (naturally), there is a very large excavation, and a good deal of raviny broken ground to the N.E. of it, and not 200 yards from it. The artillery has a large nullah dry, except in the rains, close to it due west. 3. The water supply is abundant and wholesome. 4. The refuse water and other impurities are collected in cesspools and removed daily. There is no drainage. 5. The hospital wards are 2½ feet from the ground, and there is no perflation of air under the floors. The roof water flows off by natural drainage. The whole drainage is natural and quite sufficient. The cavalry hospital is built partly of burnt and partly of unburnt bricks, the walls and roofs single, the latter tiled and not sufficiently thick to keep the building cool. The artillery hospital is thatched and cooler. There is an outer verandah all round both hospitals 8 feet wide. It constitutes a fair shelter. The inner verandahs are very frequently used for sick. The hospitals are single storied.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The following table gives the ward accommodation:—

Date of construction of Artillery Hospital, before the mutiny:—New Cavalry Hospital, 1858. New Female Hospital, 1859.

Wards or Hospital Huts.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patients' Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.			Ft.	Ft.			
Artillery Hospital -	16	48	24	22	22,754	1,422	64½	—	6	5	4
Temporary Hospital, European Cavalry, two wards.	16	50	24	18	21,600	1,350	75	—	12	6	4
New Female Hospital, European Cavalry, two wards.	—	81	24	21	15,645						
Three wards - -	—	16	24	21	8,064						

The cavalry hospital is placed so as to receive the full benefit of the prevailing winds. The artillery is too close to the city.

There are no windows. All the doors open at the centre, are opposite to each other, and well calculated for ventilation.

The wards are ventilated by the doors and saddles on the roof. Dormer windows would be a great improvement.

There are no jalousies or jhilmils.

7. During the rains thermantidotes are usual for cooling the air. They are a species of huge winnowing machine, fixed to every third and fourth doorway on one side of the building, and the air has to pass through wet kus-kus tatties, fixed to holes in their sides, before it enters the machine, and is blown into the building.
8. No means of warming are required here. The walls are swept down weekly, and white-washed annually, or as often as the medical officer requires it.
9. The position and structure of the privies are shewn in the plan of the female hospital. Copper stool pans are used in the privies; these are emptied as soon as used, and the contents carted away every morning for combustion in one of the many brick kilns that surround the station, and help to poison the air.

   The drainage from the privies runs into a cesspool close by, as seen in the plan of the female hospital. It is not allowed to accumulate there, but is baled out. There is no supply of water save what the water carriers (bheesties) afford, and at times the privies are offensive.
10. There is a lavatory room, as shown in the plan of the female hospital, supplied with earthern pans or basins, and some earthen vessels filled with water, towels, rollers, &c. It is not a convenient arrangement. There ought to be fixed basins with plugs in their bottoms, and cocks above to supply water from a cistern.
11. There are no means of bathing save a moveable warm bath and a slipper bath. There ought to be a plunge bath.
12. The foul linen is generally boiled in a large copper pot. It is subsequently taken to the river, and washed, and then dried in the sun. The plan answers very well.
13. The storage is sufficient and dry.
14. The bedsteads in use are common cots with nawai (broad tape) bottoms. Mattresses and pillows, some stuffed with tow, others with cotton, sheets, blankets, quilts, pillow cases, and a small bedside carpet for each bed.
15. The kitchen is due north of the hospital, 40 yards distant, a building of brick and lime, with tiled roof, and brick on edge flooring, a separate fire-place for each cooking vessel, the usual arrangement in this country; copper pots, frying pans, gridirons, skillets, &c. All copper vessels are tinned twice a month. The means are quite sufficient and the cooking is properly done and sufficiently varied.
16. No reply.
17. An hospital serjeant is provided for each hospital, and waiting men when required for bad cases; also native ward coolies. The attendance is not sufficient. More European supervision is desirable to keep the natives to their work. It is impossible for one man to be always on the alert, and in times of increased sickness the apathy and laziness of the natives is always embarrassing, and a source of complaint and discontent to the patient.
18. The sanitary condition of the hospital is fair, and no epidemic disease, hospital gangrene, nor pyæmia, has appeared in any part of it.
19. As a general rule, for I know of no exceptions in the hospitals in this country, they are badly lighted and gloomy. They are usually lighted, and that indifferently by the doors; these are battened, with a couple of panes of glass in them, near the top, and when from any cause they are closed the building is in almost complete darkness. Have the doors glazed down to the centre, have windows above the verandahs, as recommended for the barracks, and also have dormer windows in the roof. A hospital cannot be too cheerful or comfortable in appearance.
20. The sick are taken out on elephants, *i.e.* those who are equal to the exertion, others stroll about the outside of the building, and any very weakly man whose case requires change of air, is taken out in the dooly, if not otherwise engaged, which it seldom is in ordinary times. There is no fence nor any trees near the hospital; the men walk in the shade of the building, where the ground is level, and they have forms with backs and arms to sit upon.
21. For the women and children of the cavalry a portion of the old male hospital has been set apart; but for the artillery there is no arrangement. There ought to be a hospital for artillery women and children.
22. There are no special local hospital regulations.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont*	23. At stations the powers of the medical officer are complete; he has full control over his hospital, and it is his own fault if it is not properly kept. His requisitions for repairs, whitewashing, &c., are generally promptly attended to, and his resources as to diet, comforts, &c., are only limited by the resources of the station. He can order champagne if he deems it absolutely necessary. In camp the sanitary position of his hospital depends upon the position taken up for the general camp, and about that I was never yet consulted. 24. There are no such buildings as convalescent wards or hospitals in India that I am aware of. I do not think they would be an advantage, but quite the contrary. When a man is convalescent his great anxiety is to get back to his barracks, his box, and his comrades. Such a building would be looked on as a sort of penal settlement.
XIII. BURIAL OF THE DEAD.	1. The burial ground at the station is nearly in the centre of the cavalry officers' lines. It is to leeward of all barracks, but well to windward of some of the officers' houses, many of which are close to it. 2. It is 140 yards square. The soil stiff alluvial, of great depth. The river most probably flowed over it at some former period. The drainage is natural. I cannot say if decomposition takes place readily. It is tolerably well kept. 3. The graves are 8 feet long, 2½ feet wide, and 7 feet between each. They are 8 feet deep, and are never reopened. At ordinary times interment is compulsory from 12 to 16 hours after death. During epidemics it is never longer than 12 hours, often under 4 hours. The native burial ground, which abuts on the European, is not often used. I have not seen a grave opened. The graves are much about the same distance apart as in the European. The ground is about 40 yards square. 4. I am not aware that the burial ground is ever offensive. In the hot weather, if a man dies, say at 1 P.M., he is buried, if possible, that evening; if he dies in the evening he is buried next morning. In the cold weather there is not so much haste. 5. The dead of the camp followers, or bazaar people, are disposed of according to caste. They are either burnt, thrown into the river, or buried in native burial grounds, at a distance from the station. They are not kept long after death. 6. No injury to the public health accrues from the present practice. 7. I would recommend the closing of the present burial grounds, European and native, and establishing others outside the station.

(Signed) R. A. MASTER, Colonel, 2nd Regiment European Light Infantry, commanding at Muttra.
ARTHUR W. OWEN, Captain, Assistant Executive Engineer.
C. L. COX, F.R.C.S., Surgeon, 2nd European Light Cavalry.

Muttra, 14th July 1860.

GHAZEEPORE.

Accommodation { Queen's Troops—Infantry - Right Wing of the 77th Regiment.
Native Troops—Infantry - Military Police Battalion.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is moderately wooded, and for the most part under cultivation. It is, generally speaking, flat and dry, with much kunkur; but to the west of the station it is low and swampy. There is a fair amount of trees, but no jungle that I know of in the vicinity of the station, which lies on the banks of the Ganges. 2, 3. The station and adjacent country are on about the same general level, and the nearest mountain range is the Kymore, distant about 60 or 70 miles. 4. The station lies on the left bank of the river Ganges, and the low ground to the west of the station is liable to overflow, I believe, during the rainy season; but I am unable to furnish any particulars on my own authority. There are numerous ravines and much broken ground to the west and north of the station, and several tanks in and around it, but I have no experience of their effect on the health of the inhabitants or troops. 5. The station is open. There are the usual gardens, but nothing to impede free ventilation. The temperature of the station is not raised by exposure to reflected sun-heat. The wind varies much between the east, north-west, and west. The station is quite out of the influence of the sea breeze. The east wind, according to my experience, affects the health of the native population very much, by bringing on attacks of fever, disease of the lungs, &c. 6. The country surrounding the station is chiefly cultivated, but there are no works of irrigation near the station. Rice is cultivated on the low ground close to the north side of the station. There is no law to prevent the cultivation of indigo or the preparation of hemp or flax near the station, but I have not seen them carried on myself. 7. The city of Ghazeepore is about one mile to the east of the station. 8. Underlying the surface earth of the station is a bed of kunkur, of greater or less thickness. The ground on which the station now stands was previously unoccupied by population. 9. Water is usually found during the dry season at a depth of from 18 to 100 feet below the surface; and at from 6 to 100 feet in the rainy season. 10. The rain-fall in the higher portions of the station flows readily away, but in the low lying grounds it remains until it evaporates. The ground surrounding the station being, as a rule, a little lower than the station itself, no drainage can consequently flow into the subsoil of the latter. 11. The water supply of the station is derived from wells, which are very numerous and contain good water. Open tanks are very numerous, as in all Indian stations, but the water they

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	contain is not used for drinking purposes. I am unable to state the area of tank surface. Most of the tanks are dry, or nearly so, towards the end of the hot season. Tanks are not used both for bathing and drinking purposes, excepting those used by natives; in fact, tank water is not drank by Europeans. The water in the wells is very good and sweet, and does not seem contaminated by the amount of leaves that necessarily fall into open structures. Great nuisance proceeds from a large tank partially drained near the Gora bazaar, which must prove prejudicial to the health to a certain extent. The only means of preventing it is either to fill it up or thoroughly clean and arrange it and prohibit its use by natives for bathing and the many other purposes they are so fond of putting tanks to. 12. The water supply available for the station is very abundant, wells existing in all compounds. The water is clear, colourless, sweet, and without smell in general. The amount is perfectly sufficient, the quality good, and it is mostly soft, but no means for analysing it are available. It is raised by the usual bucket and rope, and distributed chiefly by bheesties in mussucks. 13. The existence of a large sand bank on the left bank of the Ganges, at the western end of the station, enclosing puddles of water in the hot weather, seems to render that portion of the station more unhealthy than the eastern end, where the current flows free under the bank. I know of no other points worthy of mention. 14. I have had no experience to enable me to say what amount of inquiry, as to topography, climate, diseases, sanitary condition, &c. is gone into before new stations, whether on the hills or plains, are selected.
II. Climate.	1. The following instruments for conducting meteorological observations, provided by Government, are in use at this station:—Thermometer, rain gauge, and within the last few months the aneroid barometer. 2. Table of Meteorological Observations from January 1856 to December 1859:—

Months.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Sun Temp.	Rain, Inches.	Remarks.
January	67·5	22·	78·5	56·5	90·26	·75	
February	71·8	23·75	83·75	60·	98·49	1·68	
March	82·	28·25	95·	66·75	111·3	·42	
April	88·1	21·75	99·	77·25	121·12	·42	
May	93·6	23·	105·	82·	125·41	·52	
June	92·	20·5	102·75	82·25	119·02	7·42	
July	89·75	14·	96·75	82·75	111·64	8·55	
August	89·1	19·	100·25	81·25	107·92	14·37	
September	86·7	13·5	93·	80·5	111·09	8·23	
October	82·37	17·25	91·	73·75	109·22	4·2	
November	73·75	23·	85·25	62·25	101·8	·3	
December	64·75	17·5	73·5	56·	89·88	·37	

	3. From my limited experience I can give no authoritative opinion as regards the climate of this station; but as far as I have observed, it is not very variable. The cold season is very bracing. During the hot season, when the wind is from the west it is dry and hot, and there is much dust in the air, as is the case in all parts of this country. With respect to the effect of this climate on the health of European troops, I have had no experience. September and October are undoubtedly the most unhealthy months, from the prevalence of fevers of all kinds, dysentery, and affections of the lungs; this is my experience as regards natives alone. From January to April are the most healthy months. 4. There is no district near this station with a climate more conducive to health than that of Ghazeepore. 5. The following are the stations at which I have served, viz.: Chinsurah, Subathoo (in the hills), Umballa, Gorruckpore, Bustee (Gorruckpore district), Ghazeepore, Azunghur, and Jaunpore. Of these Subathoo was the most healthy, and of the others I have no reasons to form an opinion in favour of any one over the other.
III. Sanitary Condition of Station.	1, 2, 3. No replies to these queries.

4. Table of Barrack Accommodation.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				No.	Height.	Width.
Old stables fitted up as temporary barracks.					After deducting pillars.			Feet.		Feet.	Feet.
No. 6 barrack	150	460	35	9	212,696	850·78	62·96	1·75	—	—	—
„ 7 do.	160	460	35	11	261,314	1626·9	98·8	do.	4	9·5	3·75
„ 8* do.	160	460	35	17	337,318	2108·2	98·8	do.	4	do.	do.
„ 9* do.	160	460	35	17	337,318	2108·2	99·7	do.	4	do.	do.
„ 10 do.	200	460	35	11	255,276	1276·38	79·8	do.	4	do.	do.
Guard room	25	95	18	15	29,925	1197	68	—	4	4·	3·5
Prison cells { 6 cells each	1	10	6	18·5	1,110	1110	60	—	1	6·5	3·5
Prison cells { 2 cells each	1	10	8	18·5	1,480	1480	80	—	1	do.	do.

* Nos. 8 and 9 were partially destroyed by fire on 28th March 1860. The roof has been raised since.

GHAZEEPORE. BENGAL.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. Numbers 5, 6, 7, and 10 barracks are old stables fitted up for the accommodation of European troops, but are not provided with windows; numbers 8 and 9, lately destroyed by fire, are being re-roofed and provided with windows on opposite sides. All the barracks are furnished with verandahs on both sides, averaging 8 to 10 feet broad. These are never occupied as sleeping quarters by the soldiers. Two rooms for non-commissioned officers at each end of each building are provided with jhilmils. 6. Each man has a charpoy, a blanket, seleeta, sheet, and setringee. 7. The tents used here are of the usual regulation pattern, 16 being the number of men accommodated in each privates' tent. 8. The old stables used as barracks are provided with roof ventilators along the ridge, about three feet apart. The new barracks, numbers 8 and 9, are provided with one ventilator each, occupying the central third. These means of ventilation are by no means sufficient. The barracks are provided with punkahs for cooling the air, the average cost of which is five rupees. 9. The barracks are pucka buildings, with tile roofs, and the two new barracks, numbers 8 and 9, are provided with doors and windows. 10. The floors of the old stables used as barracks are partly of kunkur and partly of brick, and are raised about one foot above the level of the ground. It is proposed to floor numbers 8 and 9 with stones, raised one foot above the ground. 11. The old stables used as barracks are not at all adapted for that purpose, and to render them so it would be necessary to raise the roofs considerably, and supply them with doors and windows. Annual repairs to the barracks and cantonments are executed by the department of public works; petty repairs by the barrack department. The commanding officer is the person responsible for the sanitary condition of cantonments. The walls and ceilings of the barracks are cleansed and lime-washed once a year, or when the commanding officer considers it necessary. 12. Each barrack is supplied with a wash-house, the water being supplied from a reservoir behind the outer wall. Leading from each is a pucka drain, which empties itself into a reservoir outside, and this again is emptied twice a day by the filth cart. 13. The cook rooms are provided with fire places (choolahs). Water is conveyed to them by bheesties, and the refuse water is collected in a large reservoir, which is emptied twice a day by the filth cart. The clothes are washed by the dhobies at the various tanks and on the river's banks, and dried in the open air, and for this there is both water and space sufficient. 14. Each barrack is provided with a privy, drain, and reservoir, which is cleaned twice a day, the filth being removed by carts. 15. The barracks are ventilated by roof ventilators and lighted by means of the entrances by day, and at night by the ordinary oil lamp. 16. There are temporary drains running parallel to and between the barracks, with a breadth varying from one to three feet, and are only of use during the rains to carry off the water. The present drainage is not sufficient for carrying away readily and efficiently all surface water, and the drainage from the lavatories, cookhouses, privies, &c., but it is in contemplation to provide a sufficiency of pucka drains. There is not, that I am aware of, any part of any building used as a barrack or hospital that is damp. The fluid refuse of the barracks mostly sinks into the ground and the solid is removed by the proper attendants. There are no cesspools or foul ditches that I am aware of near the station. 17. The station is always clean, but I do not know that there is any special service for its surface cleansing. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c., interfering with the free ventilation of the station, bazaar, &c. 19. The bazaar at Ghazeepore is like all native villages. It is drained by surface drains, and the streets are moderately wide and are kept clean. There are no latrines, but the water supply is good, and the bazaar chowdra is held responsible that it is kept clean. As usual there is the mixture of good houses and dilapidated ones, but I do not know of any dung heaps or cesspits being in any of them. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. The slaughter-house is about a quarter of a mile from the station to the south-east, and no nuisance comes from it that I am aware of. 21. The European bazaar is a regular village a quarter to half a mile from any of the barracks. The manure of the bazaar horses is carried off and used by the natives. 22. The stud stables are close to the barracks, but well separated from the hospital. Their construction is the same as the barracks which were formerly stables. The manure, I believe, is used for the stud lands. There are no picketing grounds at this station. 23. The quarters for non-commissioned officers are sufficient. There are separate barracks for married men and non-commissioned officers.
Officers' Quarters.	1. The officers live in separate bungalows belonging to private individuals. I have no suggestions to make in regard to them.
IV. HEALTH OF THE TROOPS.	1. Since I have been here there has been a great amount of fever, which during October, November, and December 1859 proved fatal to the native population to a most fearful extent. The prisoners in the jail, on the contrary, are in general very healthy. 2. Fevers, intermittent and remittent, dysentery, diarrhœa, small-pox, spleen diseases, and affections of the lungs are frequent diseases among the native population. 3. I attribute this unhealthiness entirely to the malarious nature of the climate. 4. The troops at this station before arriving here were stationed at Sasseram, Karomdah, and Dehree. During the thirteen months ending February 23, 1860, their health was good. The most prevalent diseases were fever and dysentery. They arrived here in good health on 1st March 1860, and cholera, fevers, and dysentery have been prevalent since that time. There is no portion of the men's present accommodation more unhealthy than another. 5. The troops at this station are never camped out. 6. I have been in charge of troops at the hill station of Subathoo. My experience of the effects on the health of troops of a residence there is most favourable, gained as it was from troops who had just returned from Burmah, viz., the 2nd Bengal Fusiliers in 1856. 7. No experience. 8. I approve most decidedly of selecting hill stations for troops.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	9. There is a form of diarrhœa and dysentery prevalent in Kussowlie and Subathoo most difficult to treat or cure, and I believe it is the same at most other hill stations. 10. The precautions to be observed in order to guard men on going to the hills from such attacks are those which protect them from sudden variations, especially proper clothing and the constant wearing of a non-conducting medium, such as flannel, next the abdomen. Dict should also be most carefully attended to as respects the nature of the vegetables supplied, which ought to be such as are readily digested, and the greatest care should be taken that all things are properly cooked. 11. With respect to the seasons best adapted for residence in the hills, much depends on the nature of the case, but as most benefit is to be expected from avoidance of the hot and rainy seasons in the plains, such seasons are the best for hill residence. I consider two or three years is the shortest period that would enable troops to obtain the full benefit to their health from a residence in a hill station. 12. There is no period of residence in the hills, that I am aware of, beyond which injury would be likely to be inflicted on the health of troops on their return to service in the plains. 13. There are no special precautions, that I know of, required for protecting the health of troops on leaving hill stations for the plains beyond such as are always necessary in the plains. 14. I am of opinion that it would be most conducive to the health of troops to locate them permanently in the hill stations. Frequent change of station in the plains is most beneficial to the health of troops and convalescents. 15. At Subathoo the barrack accommodation was most deficient, and the barracks were mostly built in positions that prevented proper ventilation. The hospital was very good in most respects. 16. I have no experience to show at what ranges of elevation above the sea the most suitable sites for hill stations may be obtained. 17. There is no higher ground near the station that could be advantageously occupied as a hill station. 18. No observations. 19. The best age I consider for soldiers to be sent to India is from 20 to 24 years, and they should land there either in November or December. The precautions for preserving the health of troops on first landing in India that I would recommend are a proper attention to their clothing, so as to prevent sudden chills so likely to arise during the great variations of temperature in the cold season, and the utmost precautions to prevent their drinking the common country liquor, and also a strict attention to diet so as to prevent over feeding. 20. I think that troops should be sent from the home depôts to India direct and not to any intermediate station, as much of their future health depends on the care and precautions taken on their first landing. It would be as well to send them to a hill station for the first hot season. 21. The mode of transport of troops from the port to the interior is from Calcutta to Allahabad, generally by steamer, and then by marching, or occasionally in the hot season by bullock train. 22. I consider from eight to ten years as a fair average for the service of a British soldier in India. 23. No experience. 24. Invalids about to proceed home should leave India in January, February, or March.
Diseases.	1. There is a medical inspection every Saturday at this station for the discovery of incipient diseases. 2. There has been no case of scorbutus among the troops at this station. 3. My experience at this station has been entirely amongst natives in the jail and military police hospitals, and in them I only remember in 13 months to have seen one case of hepatitis. Amongst the class of natives who come under my care it is a very rare disease. 4. I have never seen a case of dracunculus during a residence in India of 5½ years. 5. I have no experience with Europeans; but in the police hospital the cases of venereal disease are in the proportion of 1 to 12·6 of the other diseases amongst natives. No precautions against this disease are possible beyond punishing the patient himself. Amongst European troops my opinion is that the only way to keep venereal disease down is the careful supervision and licensing of women in the bazaar. In January 1856, before such regulations were introduced into the bazaar of the 2nd B. E. F., two thirds of the men in hospital were suffering from venereal. 6. The following are the diseases from which the troops at this station suffer, viz.— *Fevers.*—Intermittent, of the quotidian, tertian, and quartan types, remittent, and ephemeral. *Dysentry.*—Both acute and chronic. *Cholera.*—This year (1860) most severely amongst the Europeans; but lightly among the natives. *Small-pox.*—Very prevalent among the natives owing to their preference to inoculation. In the year ending 31st March 1860, there were in the M. P. Battalion 1,159 cases treated; 43 remaining from the previous year, and 1,116 fresh admissions, and of these 10 died. The following were the diseases treated, and the number of deaths from each disease:

Diseases.	Cases treated.	Deaths.
Fevers	547	1
Dysentery	31	2
Cholera	6	4
Rheumatism	34	0

7. The only zymotic disease I have met with is small-pox, and measles also is occasionally met with; but I have had no experience of it. Small-pox is most prevalent in April, May, and June. Great heat and in general east winds are the climatic and atmospheric conditions, which generally precede or accompany the appearance of the above diseases. In the native town

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	where these diseases prevail, the houses are nearly all alike crowded, ill-ventilated, and undrained; but the water supply is good. The prevalence of small-pox is undoubtedly due to the superstitious adherence of the natives to inoculation, whereby a constant hot bed of infection is maintained, which breaks out in the hot season into an epidemic of greater or less severity. 8. The total want of healthful occupation by the soldier when off duty must predispose him to anything like infection whilst in barracks; but whilst on the march or in the field I have generally found them more than ordinarily healthy, except when over fatigued by long marches. 9. Small doses of quinine have not been tried as a prophylactic against malarial disease. 10. General sanitary arrangements are the best prophylactic for the prevention of epidemic disease. As regards small-pox, nothing but the substitution of vaccination for inoculation will do good, and that must be a work of time or civilization, unless compulsory measures are introduced, an impossibility as regards the native population in general; but as respects residents in regimental bazaars compulsory vaccination would be a great benefit.
V. INTEMPERANCE.	1. The men of the right wing 77th regiment have been on the whole very temperate since their arrival at this station. There cannot be said to be any confirmed drunkards, as many, who in former days might have been deemed such, have become greatly reformed. 2. My duties being entirely confined to the civil department and the military police, I am unable to furnish information from any other source, and therefore cannot give any satisfactory answer to this query. Drunkenness is always punished as an offence. 3. Government rum is sold at the canteen; but none is authorized to be sold in the bazaar. Each man is allowed 2 drams a day by purchase. The spirit is of good quality; but none is taken by the men before morning parade, and such a habit would be most deleterious to health. It is never given as a ration to convalescents. No drinks other than intoxicating drinks are authorizedly sold in the bazaar or canteen. 4. The consumption of spirits in moderation can have no deleterious effect, especially after two or three years' residence in India; and in no way interferes with the efficiency or internal discipline of the regiment. 5. The sale of spirits in bazaars ought by all means to be abolished, but as sold in the canteens it can in no way be injurious. 6. Good malt liquor is preferable to spirits in any form, or any wine that could be supplied to troops at a similar price. 7. Coffee and ginger beer are much used at this station. The former taken in the early morning is, without doubt, best for the soldier in all points, but at other times, a moderate amount of stimulant is of great benefit, more especially to those some years resident in the country. 8. Beer, &c., might with advantage be substituted for spirits. 9. If beer of good quality could always be supplied as a rule, it is better than spirits, but I do not think that the total abolition of the sale of spirits would be advisable. 10. I have no recommendations to make on these points. 11. Each man is allowed to draw one dram of rum at 2 p.m., one pint of beer at 12, and one dram of rum at 7 p.m. There is no open canteen, the spirit and beer being obtained by indent, and issued at once from the tub.
VI. DIET.	1. The ration for European troops in the Indian army consists of meat, vegetables, and bread, of each 1 lb. Mutton is issued to the troops two days in the week, and beef the remaining days. The rations are inspected by the officer of the day, and the quarter-master. 2. A complete ration is issued to the troops. The men at this station have three meals a day, viz.:—Breakfast at 8 a.m., consisting of bread, coffee, and meat; dinner at 1·30 p.m., of meat and vegetables; and supper at 6·15 p.m., of bread and tea. 1 lb. of vegetables enters into the composition of the ration. 3. According to my experience the rations are sufficient. There are no special arrangements made for preventing the disposal of the men's rations, but the soldier's appetite is generally a guarantee for his consuming it himself. 4. There are two cook-houses at this station, and company cooks according to the strength of the companies, are provided. The kitchens are clean, and the water supply sufficient, but the ventilation and light are bad. The food is boiled and fried, and the cooking on the average is good, but much depends on the proper supervision of the cooks. The men complain at times that the coffee is imperfectly roasted. The men usually have coffee at the half-way halt when on a march. 5. The establishment of gardens for the cultivation of vegetables by soldiers near the station would be very desirable under the usual regulations for soldiers' gardens.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. From March to November the troops at this station wear the khakee tunic and trousers, flannel shirts, woollen socks, and ammunition boots, wicker helmets with pugaries and covers; during the remainder of the year the ordinary English regimental clothing. It would be advisable to introduce clothing of an intermediate thickness for use during the night guards in the rains and at the commencement of the cold season. The present guard dress is the full dress of the season. The protection from sun and wet for guards when on duty is that of verandahs and great coats.
Duties.	1. It would be advisable to drill the men at home or at some intermediate station before sending them to India. 2. The routine of a soldier's duties is reveillé before daylight, parade at daylight with drill, varying from half to one hour in duration; evening parade in the cold season three times a week, and during the hot and rainy seasons, roll-call in barracks. The men do not suffer from the drill. The best time for drills, parades, and marches, is in the early morning. At present the men have four nights in bed during the week, but this is from increased duty on account of rifle drill, ordinarily it is eight or nine nights in bed to one out. Guards are mounted in the barrack square, and last from one morning parade to the next. There are roll-calls every evening in the hot and rainy seasons, and four times a week in the cold season.
VIII. INSTRUCTION AND RECREATION.	1. The only means of recreation at the station are one ball court and two skittle grounds, which are by no means sufficient to occupy the men during the wet season and heat of the day. In the hot and rainy seasons the men are restricted to barracks from 8 a.m. to 5 p.m. 2. The means of recreation, &c. at this station are so very limited, that almost everything in this way has yet to be done.

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	3. A regimental savings' bank has already been established. 4. There is not sufficient protection from trees or other means to enable the men to take exercise without injury to health during the day. The verandahs, where existing, are too small, and are under water in the rains, and the only avenues are at such a distance from the barracks that the men, in order to reach them, must walk in the sun.
IX. Military Prisons.	1. The cells at this station are in a good condition.
X. Field Service.	1. There are no local regulations for field service that I am aware of not included in the General Presidency Regulations. 2. According to my experience, the medical officer has little or no power as regards the conduct of the line of march, &c. He is at liberty to offer suggestions, and that is all. 3. In most routes there are Government camping grounds set apart; otherwise, the quarter-master chooses the ground on the most elevated spot, near water and shade if possible. The medical officer may suggest or recommend alterations. 4. The sick are transported in doolies, which are allowed in the proportion of one to every ten men. If not sufficient, any means of conveyance that can be obtained, as carts, &c., are used for this purpose. Hospital supplies are carried on camels and carts. I have had no experience of the arrangements of other than regimental field hospitals, and the regulations by which I have been guided are those printed at length in the Bengal Medical Code.
XI. Statistics of Sickness and Mortality.	No information is conveyed under this head.
XII. Hospitals.	1. Plan. 2. The hospital is from a quarter to half a mile from the barracks, and still more from the stables, and entirely away from the bazaar and native houses. The site is open, and perhaps as good an one as could be chosen with a reference to the position of the barracks. 3. The water supply is good. 4. Pucka drains are used to convey away the refuse water and impurities of the hospital. 5. The buildings consist of single stories raised two feet from the ground on a solid base. The roof water runs into the drains, and the surface drainage is ample for all purposes. The roofs of the hospitals are tiled. No. 1 is built of pucka, Nos. 2 and 3 of kucha bricks, the plinths being pucka, as also the foundations. The walls are sufficiently thick to keep the hospital cool, the ventilation being effected by the roofs. All the buildings have verandahs of sufficient breadth to afford shelter from the sun's rays. The verandah of No. 1 is used for the accommodation of sick, &c., but not those of Nos. 2 and 3. The hospitals are single-storied buildings.

Table of Hospital Accommodation.

Total number of wards, 3.
Total regulation number of beds, 156.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
								Feet.		Feet.	Feet.
No. 1 -	100	180	54	10	77,540	775	93	1·75	48	7	4¾
„ 2 -	28	83½	25	15½	36,660	1,309	68·1	—	28	6½	4
„ 3 -	28	83½	25	15½	36,660	1,309	68·1	—	28	6½	4

	The hospital is so placed as to receive the full benefit of the prevailing winds. The windows open inwards, and their arrangement and construction are conducive to ventilation and coolness. 6. The buildings are ventilated by means of roof ventilators and jhilmils, which keep the wards free of odour and closeness at all times. 7. No reply. 8. The walls and ceilings of the hospitals are whitewashed whenever required on the requisition of the medical officer. 9. The privies, &c. are similar to those used in barracks. They are properly drained, and provided with reservoirs, and are not offensive. 10, 11. The lavatory arrangements are similar to those in the barracks, and the means of bathing the sick are sufficient and convenient. 12. The washing and drying of hospital linen are performed by dhobies. 13. The storage is sufficient and dry. 14. The bedsteads used in hospitals are similar to those used in barracks. 15. The kitchen is about 80 yards to the rear of the hospital. The food is cooked in the ordinary way, and is well done, and can be sufficiently varied. 16 to 24. No replies to these queries.
XIII. Burial of the Dead.	1, 2. The burial ground for British troops is about one mile from the station. The soil is sandy, the subsoil being kunkur. The ground, which is carefully kept, is drained into a neighbouring nullah and low ground. 3, 4. No replies to these queries. 5. The dead of camp followers and bazaar people are disposed of according to their religion, Hindoos thrown into the Ganges and Mahomedans buried. 6, 7. No injury accrues to the public health from the present practice, nor are any improvements necessary.

14th December 1860.

(Signed) Alexander Parden, M.D.,
Civil Assistant Surgeon.

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GHAZEEPORE.—FURTHER REPORT.

Accommodation :—Queen's Troops.—Infantry - - 848.

References to Subjects and Queries.	Replies.
I. TOPOGRAPHY.	1. The country surrounding the station stands directly on the left bank of the Ganges, and slopes gently from both sides, probably in the degree of seven or eight inches in a mile, from N.W. to S.E. It is flat and interspersed with but few trifling elevations, and in localities is dry, sandy, or swampy. It abounds in jheels or water courses; but no great extent of jungle exists. 2. The station's greatest elevation above the sea is towards its west extremity, and is about 260 feet, and probably nowhere exceeds 350 feet, owing to the extremely flat and undeviating nature of the ground.—There is no higher or healthier ground adjoining the station. 3. The nearest mountain lands are the Nepaul Hills, at a distance of 184 miles. 4. The station is directly upon the left bank of the Ganges, which, with several other rivers, —as the Gogra-Karamnassa, Tons-Bisu, and the Maughi,—intersect the country, the first three being the most important. The Ganges overflows the vicinity during the wet season, from the middle of July to near October. Ravines, water-pits, and broken ground abound in every direction, and from the filthy habits of the natives, and absence of public latrines, they are very offensive. 5. The station is open, but the free ventilation is somewhat impeded by proximity to the native city and an over-grown bazaar to the eastward. With but very few exceptions the buildings are on a level with the ground, and thus doubtless the temperature of the station is raised by exposure to reflected sun-heat. The winds are often very variable, but the S.W. and N.E. are those which mostly prevail, sudden changes of which, conjoined with other atmospherical phenomena, produce their usual effects on health. 6. Nearly every available plot of ground in the country surrounding the station is in a state of cultivation. There are no works of irrigation near, only the usual native mode of irrigating their fields from wells, &c., and this, as at present managed, has not, it is presumed, any effect on the health of the station. All objectionable cultivation can be prohibited by the commanding officer. No rules exist forbidding the cultivation of rice beyond the limits of the station; but it is not largely grown here. Indigo, hemp, and flax, with opium, maize, and sugar-cane are extensively cultivated in the surrounding district; but not with any apparent injurious effect on health. 7. The tolerably-sized town of Ghazeepore stands about 1½ miles lower down, and upon the same side of the river as the station. 8. The soil of the station may be said to consist of an upper surface of pale, light-coloured clay, resting on kunkur or calcareous conglomerate, covered by a deposit of fine sandy soil, slightly impregnated with salts of potass, while the bed of the river is composed of fine sand, intermixed with particles of mica, except at its edges, which are more clayey. 9. Water is usually found at a depth of from 12 to 25 feet below the surface in the dry, and a little less distance than that in the rainy reason. 10. The rain-fall is rapidly absorbed, and in about two or three hours the ground is fit to walk upon, even after the heaviest showers. The majority of the nullahs conduct the water-surface to the Ganges. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived from the Ganges, and numerous wells which abound; but it is not stored. These tanks are full or dry, according to the season. The impurities contained in the water are dissolved organic matter, suspended algar infusoria, and other offensive materials, which evolve carbureted and sulphureted hydrogen and carbonic acid gas. No tank water is used for drinking or bathing purposes by Europeans, though natives employ it for both purposes. These tanks and wells are liable to pollution from the filthy habits of the natives, pigs, &c. All the tanks, without exception, are nuisances, and the filling them up could be easily effected. 12. The water supply available for the station is most abundant. The colour is pure and clear, the taste slightly of salts of potass.; it will not keep any length of time. The Ganges water is, however, free from this fault. The means for correct chemical and microscopical examination are not at hand. The quality of water has not appeared in any way injurious to health, and the amount is always sufficient. It is raised in leather buckets by native water carriers and bullocks. 13. The completeness of the foregoing queries leaves little room for additional remarks. 14. New stations, whether in hills or plains, are selected by committees of professional and non-professional officers, as laid down in the Bengal Regulations. An independent "sanitary officer" should decide such matters.
II. CLIMATE.	1, 2. There are no means or instruments attached to the military department at this station for conducting and registering meteorological observations, all these being made by private instruments. 3. The climate of Ghazeepore is highly salubrious. Few stations possess such a cheerfulness of aspect, and it is celebrated for the wholesomeness of its air, and dryness of its soil, which never retains the moisture. It has also a noble reach of the river to the south-west. From the middle of October till the end of April the climate has been denominated the "Heavenly." Except during the prevalence of epidemics the health of the troops does not appear otherwise than good, but of course, during the prevalence of these, the unhealthiness is much the same as at most other Indian stations. The cool mornings and evenings are the proper times for drills, &c. During January, February, and March, the comparatively cold and dry months, remittent, intermittent, and ephemeral fevers of a mild type prevail, and, from careless exposure at night, &c., diarrhœa and colic are induced. In April, May, June, and July, when the greatest degree of heat is felt, various forms of these fevers occur, the "continued" not unfrequently assuming the character of "ardent fever" of Indian authors. Dysentery, with and without hepatic complication, cholera, and other intestinal affections amongst Europeans and natives, are met with alike. In August, September, and October, bilious remittent fever and diarrhœa most commonly prevail. During November and December unless the rains have continued far into October, sickness decreases, and slight ailments of a general character only exist.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	4. There is no higher ground whatever in the neighbourhood of Ghazeepore. 5. The following is a list of the stations at which I have served:—Bengal, North Western Provinces, and the hill sanitarium of Darjeeling, but chiefly at Ghazeepore, and none have appeared particularly inimical to health.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station and surrounding country, with ground plan of barracks, &c. are transmitted herewith. 4. For table and barrack accommodation *vide* the preceding report. 5. The doorways in the barracks serve as windows, and are placed at intervals along each side, and at each end (where only small windows exist), and have Venetian shutters. Verandahs run along each side of the building and across the south end, but they are never permitted to be occupied as sleeping quarters by soldiers or other persons. There are no jhilmils in the barracks, but they exist in the hospital, are of proper construction, and renewed as often as as is necessary. 6. The bedsteads should be of iron, with cane bottoms, as the present wooden ones are infested in a few weeks with bugs and other vermin to such an extent as to defy sleep. Pillow cases would be of great service, for the pillows soon become saturated with perspiration, and consequently dirty, and offensive to sight and smell. The material of which the sheets are made is too thin, and the supply is inadequate. 7. The tents supplied to Europeans are made of country material, and are intended to contain 20 men each. They are generally about 15 feet square. 8. The barracks at Ghazeepore are ventilated by raised and covered openings along the centre of the roof. These means are sufficient for the present style of buildings. No permanent cooling apparatus or other means are used here. During the hot winds the doors and windows are covered with a framework or "tatties" of grass called kuskus, which are kept constantly wet, and thus considerably lower the temperature of the apartments. 9. The barracks, &c., are constructed of kiln and sun-dried bricks, mud, plaster of brick-dust and lime; bamboos, suchoo wood, &c., with layers of straw and mud underneath the tiles. Tents are made with bamboo-poles and cotton cloth of country manufacture. The native huts are of mud with bamboo and grass, and grass or mud roofs. 10. The floors of the barracks, &c., are constructed of bricks, Chunam flags, concrete of brick-dust and lime, mud, &c. The barrack floors are level with the surrounding ground, and there is no passage of air beneath them. 11. Barracks should be constructed on arches not less than 5 feet from the ground, with grated openings along the centre of each room, side openings along the upper part of the wall; both to open and close during the hours the hot winds blow. Upper stories should be built, and used for sleeping apartments only (open gratings should be placed along the centre of the floor communicating with the external air by tubes, &c.), and they should be double-roofed with permanent openings along the centre, and placed at such an angle as to benefit by the prevailing winds, S.W. and N.E. Tents should have openings at the top; at present they merely collect and retain a most vitiated atmosphere. The barracks and cantonments are kept in repair by the officer commanding the station, assisted by the quartermaster. The senior medical officer is designated "Sanitary Officer," and reports weekly to the head of the medical department. The walls and ceilings of the barracks are cleansed and limewashed annually, or as often as may be certified to be necessary by the medical officer. 12. A sketch of the men's lavatory is transmitted. There is a good-sized lavatory to each barrack, supplied by water-carriers. The drainage of these is imperfect, and their contents merely run out upon the ground. This, however, will shortly be remedied. A large swimming bath is still a desideratum. 13. A sketch of the barrack cook-houses is transmitted. The means of cooking are ample, according to the simplicity and fewness of the culinary wants of native cooks. The water is brought by the native water-carriers from the adjoining wells. The refuse will shortly be made to run into reservoirs, and be carted away. The washing and drying of the linen are performed by dhobies, or native washermen, who are always to be had in abundance. 14. A sketch of the privies, &c., is transmitted. Each privy has a water-tight reservoir, with a lid, and the contents are carted away twice a day to a large tank about two miles from the barracks. 15. The barracks, &c., are lighted at night by oil lamps, suspended from the roof at regular intervals; but these means are very deficient, and compel the men to buy their own candles or oil. 16. No system of drainage and sewerage, properly so called, exists at this station; but shallow, saucer-like drains are cut around each barrack and other buildings, merely to carry off surface water, and empty themselves into tanks, nullahs, or the Ganges. In the rainy season the barracks must necessarily be damp, from being upon a level with the ground outside. The hospitals are not so, owing to their being somewhat raised, and to having a flag flooring, which the barracks (with the exception of the "married quarters") have not. Urine tubs are placed along the verandahs at night, and are emptied next morning into the privy reservoirs, and thence carted away. The place of deposit is about two miles distant from the barracks, and is merely a large excavation caused by making bricks, &c. It is clear of all wells. The privies are placed at convenient distances from the men's quarters, varying from 20 to 50 yards, and, as before stated, their contents are carted away by the conservancy department, morning and evening. The extreme cleanliness observed keeps them as free from smell as possible, and the liberal use of charcoal and lime is attended to. Ditches exist in every direction round about the station, and, from the want of public native privies, the dirty habits of the people, and other causes, they cannot be otherwise than foul. 17. The general surface cleansing of the cantonment and its vicinity is as good, if not better, than is usually found in cantonments, particularly where native troops are in proximity. The cleansing staff is sufficient, and can always be increased, temporarily, be requisition to the commanding officer. 18. The surface of the cantonment is kept free of vegetation, but might with advantage by laid out as a garden, &c. As before stated, the ventilation of the whole cantonment would

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References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	be improved by the total removal of the overgrown bazaar at the east extremity to the S.W., where a much better site could be obtained. 19. For sanitary condition of the bazaar as to drainage, ventilation, cleanliness, water supply, &c., *vide* Appendix to this report. The regulations and police arrangements are those laid down in the Bengal code. The whole bazaar should be removed as recommended by a medical committee. The native houses near the station are everywhere surrounded by filth of every description, to which the natives are indifferent, notwithstanding the strictest watchfulness of both civil and military police. Nuisance is experienced in barracks in the hot weather from wind blowing over the native dwellings, and also more particularly after slight showers of rain. This nuisance could be prevented, that is, to a limited extent, by the erection of public privies, but Asiatics will defile the country in spite of any regulations. 20. Animals for the use of the soldiers are slaughtered at about a mile away from the barracks. No particular regulations regarding the slaughtering places exist, the offal is thrown into the Ganges or tanks. No nuisance is experienced in the station from these places. 21, 22. There are no picketing grounds or stables whatever in or near the station. 23. There are two ranges of quarters for married non-commissioned officers and men, and these, recently erected, are somewhat small but sufficient. They are considered "temporary, "and according to standard sanctioned by Government." A few married families occupy small rooms at either end of each building occupied as a barrack, but none are in the rooms used by the unmarried soldiers.
Officers' Quarters.	1. The officers' quarters at this station are the ordinary bungalows of the country. I would suggest as improvements, that new ones be erected so as to catch the prevailing winds, and that water-tight reservoirs be placed for the refuse from the cook-houses, stables, &c., and which ought to be regularly carted away.
IV. HEALTH OF THE TROOPS.	1. The station and surrounding district are generally very healthy in every direction. 2. The following are the diseases of the native population. Small-pox, intestinal affections, remittent and intermittent fevers during the hot season, and at the changes of the monsoon. Pleuro-pneumonia, bronchitis, and sore throats are common in the cold season, and enlargement of the spleen and mesenteric glands prevail everywhere. 3. Malaria, want of sanitary arrangements, and poverty of food are the chief causes to which I attribute these diseases. 4. The troops at this station served 10 years in the island of Ceylon, and arrived in Bengal June and November 1857. During their service in the former place they suffered from epidemic cholera, three times from the endemic remittent fever, dysentery, diarrhœa, and enlargement of the spleen chiefly; but the general state of their health was as usual with white troops serving in that island, as detailed in the valuable statistical reports. On their arrival in Bengal, at a time when troops were so urgently needed, they were little fitted for the exposures and fatigues of an Indian campaign, for there is no 'cold season' in Ceylon to recruit the health of the soldier. They reached the station of Ghazeepore in August 1857 and March 1858, and have suffered from endemic dysentery, remittent and intermittent fevers, sporadic cholera, diarrhœa, hepatic derangements, obstinate enlargement of the spleen, and from primary, secondary, and tertiary syphilis. No portion of the men's accommodation at this station is more healthy or unhealthy than the rest. 5. The troops at this station have not as yet required to be camped out. 6. I have been in charge of troops at the Hill Sanitarium of Newera Ellia,—the intermediate station of Kandy in the Island of Ceylon,—and that of Darjeeling in Bengal. Experience has taught that they are not sufficienty availed of for the residence of European troops. Both the above sanitaria are placed at too high an elevation. The Pusilawa range in the former, and Curzeon in the latter seem preferable sites. 7. Ample observation proves that though the change to these hill stations suspends for a time organic disease, and also the accompanying fever, always of the remittent or intermittent type, yet on the return of men to the plains they appear more readily to suffer from fever, &c., and existing disease is accelerated to an incurable degree, or fatal termination. 8. Of the great advantage and permanent good of locating troops in hill stations of proper elevation there cannot exist two opinions, particularly if ample employment by gardening, working at trades, agriculture, &c., &c. be given to the men, without which intemperance and its results will always prevail to a greater extent than in the plains. 9. Troops on going to hill stations are liable to be attacked chiefly from diarrhœa. At Darjeeling this and remittent, and intermittent fevers are not unobserved. 10. Ample employment should be given to the men located in hill stations to enable them to benefit by such residence, and of the marked good of this proofs are not wanting; the benefits will vary accordingly. 11. At the elevation named in reply to query six, benefit is derived during the whole year. At the higher elevations the avoidance of the heavy rains has appeared advisable, and the colder season there from October to April is better suited to the younger soldiers than to those who have become debilitated by long residence in the plains and from other causes. The best preventive to disease is the constant employment of both body and mind by executing every want, as butchering, tailoring, baking, shoemaking, flour grinding, &c. To enable troops to obtain the full benefit of a residence in the hills their stay should not be less than two years, but even a twelvemonth's residence in correctly selected cases is extremely beneficial. 12. If the above precautions be attended to there is no period of residence in the hills beyond which injury is likely to be inflicted on the health of troops on their return to service in the plains. 13. Troops should not be marched from hill stations to the plains later than February, but this depends of course upon the distance to be marched. 14. Both service in the hills with short periods in the plains, and service in the plains with short periods of service at hill stations, would be productive of the most beneficial results to the health of troops serving in India, provided the before named "precautions" were adopted. Frequent change of station in the plains would unquestionably be beneficial to the health and spirits of troops and convalescents—two years at one station should be the limit. If much or unusual sickness prevails at any time, immediate removal should take place, and with soldiers will always act beneficially. 15. At both the hill stations I have referred to the accommodation is very defective, and the position of the barracks, &c., bleak and cheerless. A more positively objectionable site for barracks than that selected at Senchal near Darjeeling could not have been made. For

References to Subjects and Queries.	Replies.
IV. Health of the Troops Troops—*cont.*	nearly two-thirds of the year it is enveloped in mists, or deluged with rains, is difficult of access for supplies, and is somewhere about 7,500 feet high. These barracks, however, have not as yet been occupied (February 1860). 16. Martin has correctly stated at what ranges of elevation above the sea the most suitable sites for hill stations may be obtained, and no one judging from actual personal observation can disagree with him on this point. 17. There is no higher ground near this station which could be advantageously occupied as a hill station. 18. See MacClelland on the particular classes of surface and subsoils more healthy and unhealthy than others, and whose opinions on this subject are concurred in. 19. Troops should not be sent to India until they are well formed, and have been "made soldiers" for at least three years at home. Both officers and soldiers now sent to this country are mere boys, whose whole strength is wanted to mature their manhood, and from being unable to withstand the enervating effects of climate, must, and too often do, resort to objectionable habits. The men should land at Calcutta never later than November, so as to give ample time to reach up country stations before the oppressively hot season begins. For this Presidency, troops land at Calcutta, and are thence despatched up country by river steamers and flats, or floating wooden barracks, and by bullock train along the Grand Trunk road, and by stated marches. The following are the precautions I would recommend for preserving the health of troops on first landing in India, viz.:—That the detention at Calcutta be no longer than positively required; less crowding in the barracks of the place; the supervision of an officer from each corps to which the men belong; the marching in lighter clothing than the European uniform; distinctly informing each individual by printed forms of what he is entitled to immediately on landing, and while serving in India; and the insertion in the end of his small book of a few "simple precautions against sickness," so as to warn the inexperienced against that which is so positively injurious in this country. 20. Troops destined for India should be sent direct from the home depôts, and not to any intermediate station for a certain time. With larger barracks, a more cheerful aspect of cantonments and buildings, the establishment of workshops, libraries, reading-rooms, coffee and smoking-rooms, and other modes of keeping their time employed, soldiers might without disadvantage serve first in the plains. 21. The following seem to be the only precautions needed for the preservation of the health of troops "*en route*:"—The less crowding of the men on board the river steamers or flats, and in the bullock trains; the greater attention to personal ablution, and cleanliness of linen and other garments, and, above all, the supervision of an officer from the regiment to which the men are proceeding. 22. British soldiers should serve in India seven years, and officers ten, by which greater efficiency, better health, and actual gain to the State would result. Speaking generally, the ailments of European soldiers for the first five years are slight, and easily overcome; after this, dysentery and diarrhœa become more severe, and less amenable to treatment, and enlargements of the spleen also continue to be obstinate. From this time to nine years, hepatic affections and enlargements are of more frequent occurrence, and after nine years the soldier appears but little able to bear up against disease, and the results of anæmia become apparent. 23. With respect to invaliding, greater weight should be given to the opinions of local medical committees. Men often apparently improve by river voyage or transit train to such a degree as to mask, or often conceal, the serious nature of the disease for which they were invalided, and are often sent back only to enter the regimental hospital on the return of the hot or wet season, and there remain until the cold or invaliding period returns. 24. Invalids should certainly leave India for home before the setting in of the "hot season."
Diseases.	1. Inspection parades, for the discovery of incipient diseases take place regularly once a week at this station. 2. Scorbutus occasionally occurs as an accompaniment or sequel to dysentery, or long-continued diarrhœa; but, so far as has been observed, to no very great extent. 3. The proportion of cases of hepatic disease under treatment for the past 12 months has been 38, and in nearly every case was traceable to indulgence in spirituous liquors, and exposure to solar influence. It has not by any means been observed to be commonly complicated with any other disease. Malt liquor should be sold cheaper in preference to spirits. 4. Dracunculus has not been observed at this station. 5. Venereal is unquestionably and unfortunately the disease of military hospitals, and prevention of its evils of the utmost importance. The proportion of venereal diseases to the total treated in hospital for the last 9 months (ending December 1859) has been one in 5·93. I would recommend as a step towards the prevention of these diseases that the old practice of registration, periodic examination of women, and re-establishment of lock hospitals, be resorted to at every station. The latter can be easily conducted without in any way interfering with the prejudices of caste, &c. 6. The following are the diseases from which troops at this station suffer, viz.:— *Fevers.*—Remittent and intermittent fevers prevail both endemically and epidemically; chiefly of the bilious and tertian types. *Dysentery*, *Cholera*, } Both prevail here. *Small-pox* is confined almost entirely to the natives. *Rheumatism* occurs, but only as the result of previous syphilis or gonorrhœa. The following is the proportion which the admissions and deaths from the above diseases bear to the total admissions and deaths for 9 months ending 31st December 1859:—

Diseases.	Admitted.	Died.
Fevers	1 in 1·82	1 in 4·85
Dysentery	1 „ 15·55	1 „ 3·09
Cholera	1 „ 114·42	1 „ 3·40
Small-pox	None.	None.
Rheumatism	1 in 77·21	Do.

	7. The nosological characters of the more frequent zymotic diseases are now so well known, and in no way differ at this station, so perhaps a mere enumeration may be omitted. These diseases are most prevalent during the hot season and changes of the monsoon. The climatic and atmospheric conditions which accompany or precede them are also well known,

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	and do not offer any peculiarity worthy of note. But the longer the rains continue, so does disease increase generally; and the same may be said of any unusual degree of lowness of the Ganges. The habits and customs of all natives invite this class of diseases. These subjects, however, are now receiving great attention from the magistrates and municipal authorities. The personal habits among the troops and native population which predispose to these diseases have already been pointed out. 8. The prevalence of epidemic disease among the troops may be said to be influenced by exposure at night particularly, the want of occupation while in the barracks, perhaps the indulgence in intoxicating drinks generally, and needless exposure to solar influence. 9. Small doses of quinine have not been tried as a prophylactic against malarial disease at this station.
V. INTEMPERANCE.	1. The soldiers at this station are by no means intemperate, considering the many depressing influences, and there are certainly not more than half a dozen "confirmed drunkards" among 848 men. 2. There have been 21 admissions for delirium tremens during the past 9 months (ending December 1859), and of these 3 died. I cannot state with sufficient accuracy to be of any use the number of admissions from diseases caused indirectly by intemperance, neither can I (from want of correct data) furnish a table to show the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station. Drunkenness is always punished as an offence, as directed by general orders on the subject, and 51 men were punished for this alone during the past 9 months (ending December 1859). 3. Distilled spirit is sold in the canteens as permitted by regulation, and surreptitiously in the bazaars, and other places. Every care is taken to have it of good quality, and the amount allowed to each man by regulation is 2 "tots," or about 6 oz. per diem. Spirit of good quality is issued, as per regulation, at the station, on the march, and in the field. Men are not supposed to take a dram before morning parade, as hot coffee is provided for them, and recommended to be used. Spirit is not given as a ration to convalescents, but where the health of the soldier requires it, malt liquor is permitted to the extent of 1 or 2 pints daily. No injurious drinks other than intoxicating ones are permitted to be sold in the canteens; but highly intoxicating and injurious drinks can always be readily procured from the natives, and this it is impossible to prevent. 4. Whether the consumption of spirits by troops and convalescents is conducive or injurious to health must of course depend on the quantity taken, and at what time. At this station the men are encouraged to take it with, or immediately after, meals. There is no doubt of the injurious effects of spirit drinking in all hot climates, and it should be discountenanced as much as possible. Without the sale of good spirit and cheap malt liquor, under responsible supervision, the soldier will only consume the very highly injurious and often poisonous liquors concocted by natives, which would, no doubt, tell most materially on the internal discipline and efficiency of the corps. 5. I would recommend its use to be discountenanced by every legitimate means; but until drinking becomes less than a national vice, and means for the employment of the soldier's mind and body while off duty are provided, the issue of good spirits, or better still, of cheap malt liquors, ought to be continued under responsible supervision. Its sale in the native bazaars should be entirely prohibited. 6. Good malt liquor has been rarely observed to produce disease. Few men can get drunk on this, and its moderate use appears advisable, especially during the hot season, and under certain circumstances of fatigue, debility, &c. The substitution of a good, light, and cheap wine for spirits would also doubtless be of advantage. 7. By a very great many at this station, coffee, tea, lemonade, ginger beer, soda water, and similar drinks are preferred to spirits, and the sale and use of these should be encouraged in every way. 8. The use of tea and coffee before parade of a morning for all, and again at midnight for those going on and coming off sentry, ought to form part of the diet for troops, and not be left optional as at present, in which case half a loaf might be issued at evening meal with advantage. The use of a cup of hot coffee and a crust of bread at midnight has been attended with marked benefit at this station. 9. The benefit arising from the prohibition of the sale of spirituous liquors has been fully pointed out in answers to previous queries. 10. In addition to the recommendations already indicated, the canteens should be better furnished, have coffee and reading rooms attached, be better lighted, increased permission given to friends of the soldier to visit these places with him; a larger stock of actual and all small necessaries kept for sale, and the incumbents of canteens be permanent. Discharged married soldiers with families might be usefully employed in this way. 11. Canteen and bazaar rules are all laid down in the Bengal regulations, and, as far as can be ascertained, they are strictly adhered to. The following is Sir Charles Napier's "Advice to Soldiers":— "Let me give you a bit of advice, that is, don't drink. I know young men do not think much about advice from old men. They put their tongue in their cheek and think they know a good deal better than the old cove that is giving them advice. But let me tell you you are come to a country where, if you drink, you are dead men. If you be sober and steady you will get on well, but if you drink you are done for. You will be either invalided or die. I knew two regiments in the country, one drank, the other did not drink. The one that did not drink is one of the finest regiments, and has got on as well as any regiment in existence; the one that did drink has been all but destroyed. For any regiment for which I have a respect (and there is not one of the British regiments I don't respect) I should always try and persuade them to keep from drinking. I know there are some men who will drink in spite of the devil and their officers, but such men will soon be in hospital."
VI. DIET.	1. The ration for Queen's British troops and European troops in the Indian army is the same, and is composed as follows:—on land, viz., 1 lb. bread, 1 lb. meat, 4 oz. rice, 2½ oz. sugar, ⅘ oz. tea or 1⅔ oz. coffee, 1 oz. salt, 1 lb. of vegetables, and 3 lbs. firewood. The same rations are issued on board river steamers, except that salt-beef or pork is substituted for fresh meat, and instead of salt being given weekly, 2 oz. ground mustard seed, 1¼ pint of split peas, and 1½ pint of vinegar are issued per man. A responsible inspection of the ration is made daily before it is issued, and receives the attention of an orderly officer, medical officer, and quartermaster, also of non-commissioned officers and men from the companies.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	2. A complete ration, in which the proportion of vegetables is 1 lb. per man, is issued daily. The men at this station have three meals a day, viz., breakfast at 8 o'clock a.m., dinner at 1 p.m., and evening meal at 6 p.m., consisting of tea or coffee, bread, and their rations divided into portions. 3. As an improvement in the ration, fish might be given, and the men allowed to procure game, &c., so very abundant at every station. Disposal of any portion of the ration by the troops is forbidden. 4. The means of cooking are ample enough; but the present system of issuing copper vessels to be tinned twice a month seems very objectionable. The kitchens are clean, light, sufficiently supplied with water, well ventilated, and daily inspected by orderly and medical officers. The meat for the most part is made into good soup with the vegetables. The cooking is properly done and sufficiently varied; but fish is so abundant and cheap that it might be given in addition. It is almost uniformly a rule that the men have tea, coffee, or other refreshment before a march, but this should be made a strict regulation. 5. Gardens for the cultivation of vegetables by soldiers could be advantageously established near the station and would be of the very greatest good, Government supplying the necessary tools and seeds, and allowing a fair proportion of water carriers. Canteen funds might also perhaps do much in the way of up keep.
VII. Dress, Accoutrements, and Duties.	1. The men at this station wear the usual uniform and accoutrements as laid down by regulations, together with a light summer one of American drill, dyed khakee or dust coloured, and a cane helmet covered with the like material. Generally there is little objection to be made in the present dress, as the altered style and material have been a great boon to European soldiers. The red serge tunics issued for winter wear should be lined with thin flannel or American drill. Good sized and very light waterproof caps should be used by the men on guard when moving during reliefs, &c. During the wet and cold seasons the European clothing and great coats are worn by the men on guard.
Duties.	1. It is unhesitatingly asserted, after much thought and observation on the subject, that each man should be a "made soldier" at home for at least three years before being sent out to this or any other tropical climate. 2. The usual routine of a soldier's duties at this station is very light, and the greatest care is taken in no way to prolong or have them at such times as are likely to prove injurious to the health of the men. The best time for drills, parades, and marches is the "early morning" as directed by general orders. The men at this station have on an average five or six nights in bed during the week. 3. Guards are all mounted in the immediate vicinity of the barracks. Day guards last 24 hours, night guards from sunset to sunrise, and sentries are relieved every two hours. Roll calls are made six times during the day and once at night. If night guards *could* be altogether discontinued the sickness among soldiers would doubtless be very small indeed.
VIII. Instruction and Recreation.	1, 2. The following are the means of recreation and instruction available for the men at this station.—1st. A good ball court, which should be roofed and correctly ventilated.—2nd. Two skittle grounds near the barracks, which are very much too short.—3rd. A school with good schoolmasters; and, 4thly, a very good theatre belonging to the station officers, but the use of which is sometimes permitted to the men. There are however neither day rooms or soldiers' clubs, soldiers' gardens, workshops, gymnasia, nor room available for a reading room for the men. The above means are not sufficient to keep the men occupied during the heat of the day or in the wet season. The strict regulations respecting restriction to barracks when off duty during the wet weather and heat of the day, are properly adhered to, with corresponding advantage to the health of the men. 3. The institution of soldiers' savings banks at this station would be very advantageous. 4. There is not sufficient shade from trees, sheds, or verandahs to enable the men to take exercise without injury to health during the day.
IX. Military Prisons.	1. Cells for eight prisoners have been recently erected here according to the standard plan sanctioned by Government. They are suitable enough for the cold weather; but are somewhat confined for the hot season.
X. Field Service.	1. No local regulations for field medical service exist. 2. The powers of the medical officer as regards the conduct of the line of march of troops, camping, bivouacking, &c., of course depend entirely upon the appreciation of sanitary police possessed by commanding officers. If they appreciate this, the recommendations of medical officers are always properly attended to and carried out. 3. The perfect nature of the regulations in India for the preservation of health, as to the selection of camping grounds, ventilation, and generally sanitary regulations, &c., &c., are too well-known to need description here. 4. The regulations adopted in the Presidency for field hospitals, ambulances, transport of the sick and hospital supplies, &c., will doubtless be furnished by the head of the medical department.
XI. Statistics of Sickness and Mortality.	No information under this head is transmitted.
XII. Hospitals.	1. Ground plan of the hospital is transmitted. 2. The three hospital buildings stand at the western extremity of the ranges of barracks, at a distance of about 150 yards, while the bazaar, and houses of the native population generally, are quite at the opposite end of the cantonment. The site is open and generally healthy as to elevation, drainage, &c., but the buildings are so placed as not to benefit by the prevailing winds, and a better site is where the old military hospital formerly stood. 3. The water supply is ample in every respect; but good and tolerably large baths are still wanted. 4. There is a mere surface drain to convey the drippings of the roof away. 5. The wards are raised about two feet above the ground; but there is no perflation of air beneath the floors as there should be. One building has a masonry drain all round it for conveying away the roof water, but the other two buildings have no such provision. The hospitals are constructed of kiln and sun-dried bricks, plaster of brick dust and lime, roof of country wood and bamboos, and tiled with a layer of straw underneath. The walls, &c., are all single, but of sufficient thickness to keep the hospital cool. There are verandahs on both sides of the hospitals 9 feet broad, but they are never used for the accommodation of sick, convalescents or others. The hospital consists of one flat. For table of hospital

GHAZEEPORE, BENGAL.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	accommodation, *vide* preceding report. The hospital buildings being in echellon receive benefit from prevailing winds. There are no windows, properly so called, the doorways answer for these for ventilating and cooling the hospitals. 6. The wards are ventilated by raised and covered openings along the roofs. Perflation of air under the floor, and along its centre would be a great improvement. The jalousies and jhilmils are of the ordinary construction. 7, 8. The means for cooling the wards will be best seen by the section of the hospital roof on the plan. The wards do not require warming. The walls and ceilings of the hospital are cleansed and limewashed once a year by regulation, but on requisition can be repeated as necessary. 9. The plan of the privies and urinals annexed to the hospital is transmitted. Their contents are removed twice a day, while the daily washing and use of charcoal and lime keep them tolerably free from smell. 10, 11. The lavatory arrangements of the hospital consist of fixed washhand basins and bathing tubs, and have generally proved sufficient for the purpose. 12. The washing and drying of the hospital linen are performed by the natives at the river side, by their usual simple but efficacious plan, the clothes being previously well boiled with wood ashes. 13. The storage at present is sufficient and dry. 14. The bedsteads used in hospital are of common country wood, and infested with bugs and other vermin to the great distress of the sick. They should be of cast or wrought iron, with cane bottoms. Scalding the bedsteads with a solution of turpentine, corrosive sublimate, &c., is resorted to to destroy these insects, but with very partial success. 15. Pots and pans, &c., are supplied by Government for cooking purposes, and are quite sufficient, for a native cook requires but little aid of any kind beyond firewood. 16. Copies of diet tables, diet rolls, &c., will doubtless be forwarded by the head of the medical department. 17. The hospital attendance is liberal, and performed by natives with European supervision, according to the Bengal regulations. 18. The sanitary state of the hospital is as perfect as the means will allow. Of course all the buildings generally are most unsuitable for hospital purposes in this climate; but no better are available in the station. 19. I would recommend that a new hospital be built on the site of the old one. 20. Convalescents exercise on the unshaded space of ground in front of the hospital, where there are seats. Those who can bear it are permitted the use of elephants and doolies, night and morning, for rural rides. 21. The sick wives and children of the soldiers are generally treated in their own quarters, and there is nothing at present to suggest in this respect. 22. There are no local hospital regulations. 23. The powers of the medical officer as regards the sanitary state of the hospital, repairs, change of diet, &c., are considerable, if requested with discrimination, and clearly shown to be useful and necessary. 24. Wards or hospitals for convalescents might be established here; but, as a rule, men are not discharged till fit for duty.
XIII. BURIAL OF THE DEAD.	1, 2. The burial ground for British troops is about 1½ miles to the S.W. of the barracks. The N.E. wind blows over it to the open country. Its area is about two acres, and the nature of the soil is similar to other parts of the station already described. The drainage is merely superficial, and conveys the surface water to a nullah, and thence to the Ganges. The ground is carefully kept, and decomposition takes place readily. 3. The graves are dug large enough to admit of one coffin each, and there is the width of a grave between each. They are about 6 feet deep, and are never re-opened. The time of interment after death is decided by the medical officer. Early morning, or a little before sunset, is the usual period of burial. 4. The grave-yard is upwards of a mile from the barracks, and is not offensive. 5. The dead of camp-followers and bazaar people are disposed of according to caste; burnt, buried, or thrown into the Ganges. 6. Injury to the public health doubtless generally accrues from the present practice; for the pollution of Indian rivers is beyond the conception of those who have never witnessed it. 7. No improvement can be made, at least without, perhaps, interfering with the religious prejudices of the people.

(Signed) HENRY KENT, Major, 77th Regiment, Commanding Station.
J. W. FLEMING, F.R.C.S., Surgeon, H.M.'s 37th Regiment.

10th June 1860.

APPENDIX.

SIR, Ghazeepore, December 1858.

As it appears to me that what is now called the "Station Bazaar" has entirely lost the purposes for which it was originally sanctioned, and as contemplated by Government Regulations, I would, as intimately connected with the general health, cleanliness, and appearance of the cantonment, most seriously call your attention to the propriety or safety of permitting its existence as at present.

A very cursory survey of the place will at once convince any one that a more perfect hot bed for the production and dissemination of disease could not exist. From having originally occupied ordinary space, it has now increased to such an extent that there is barely a square yard of ground uncovered. Its inhabitants, streets, and lanes are crowded to excess, and beyond safety, a very large body of persons, having no right whatever to reside therein; improper trades are carried on; filthy pigs, donkeys, and wretched and diseased beggars, &c., are observed in almost every lane; obnoxious pits exist in nearly every street; drains are uncut, the ground unswept, filth unremoved, ventilation rendered utterly and totally impossible, the oppressiveness of the stench almost unbearable, even at this season of the year, and, above all, there exist pestiferous tanks at its northern and southern extremities.

I would, therefore, suggest for your consideration the advisability of assembling a medical committee, to report as to its influence on public health, and to consider the advantage of total removal to a more appropriate site, or the demolition of such houses, lanes, &c., as may be in its opinion necessary.

Further to show the necessity of immediate steps in the matter, I may mention the additional fact of there being actually crowded in a space of ground 2,210 long, with a mean breadth of 851 feet, certainly not less than 5,000 human beings, to say nothing of cows and other animals. I have not been able to ascertain the exact number of

persons, as no "registry" exists, but the calculation stated is, I have no doubt, under the mark.

I have the honour to be, Sir,
Your most obedient Servant,
J. W. FLEMING, F.R.C.S.

To the officer commanding the station, Ghazeepore.

EXTRACT of a letter, No. 3,612, dated 27th July 1860, addressed by the Quartermaster-General of the army, Bengal Presidency, to the officer commanding at Ghazeepore, having reference to questions not properly answered on the Sanitary State of the Indian Army.

QUESTION 4.—TOPOGRAPHY.—"Is there any broken ground, or are there any ravines or water pits near the "station? and what is their effect on health?"

Answer.—"These abound in every direction, and from the "filthy habits and absence of public latrines are very "offensive."

"I presume that natives are alluded to in this remark, and "beg you will inform me whether public latrines for their "use could not be adopted at Ghazeepore, as is the custom "in almost every other station, cantonment, and bazaar in "the Presidency."—*Further answer, vide letter annexed.*

QUESTION 5.—TOPOGRAPHY.

Answer.—"It is open, but the free ventilation is some-"what impeded by proximity to the native city, and an "overgrown bazaar to the eastward."

"With reference to former correspondence on the subject "of this Gora bazaar, I beg you will inform me what is "being done to remedy the evil complained of."—*Further answer, vide letter annexed.*

QUESTION 2.—CLIMATE.

Answer.—"There are none attached to the military depart-"ment, all such observations are made by private instruments."

"Are not thermometers, barometers, rain gauges, and "other instruments supplied by Government for use and "record in hospitals of European troops?"—*Further answer, vide letter annexed.*

QUESTION 1.—SANITARY CONDITION OF STATION.

Answer.—"Herewith annexed."

"This has not been sent, though the reply states, 'here-"with annexed,' the only plan received is one of the "station alone."—*Further answer, vide letter annexed.*

(True extract.)
HEN. ROBERTS, Major,
D.A. Quartermaster General of the Army.

SIR, Ghazeepore, August 25, 1860.

IN reply to your letter No. 3,612, dated 27th ultimo, on the subject of my answers to queries issued by the Royal Sanitary Commission, I have the honour to report further, for the information of His Excellency the Commander-in-Chief.

TOPOGRAPHY.—1st. That I purpose having public latrines constructed for the use of the natives in the Gora bazaar, similar to those in use at other stations in India, part of the expense to be borne by the natives themselves, and part by the bazaar fund. These, which will probably occupy about a month or six weeks in building, are much needed, and will be a great improvement to the station in a sanitary point of view when completed.

Question 5. TOPOGRAPHY.—2. No steps have been taken yet to raze any portion of the Gora bazaar. The recommendation of the Station Committee, as you are aware, have received the sanction of Government; but without a grant of public money, or an order to me or whatever officer may be in command to pull down the houses, without reference to the vested interests of the natives, I do not see how they are to be carried out. In the latter case, prison labour might be made available, but, at present, I believe there is an order against the magistrate employing prisoners outside the prison walls.

Question 2. CLIMATE.—3rd. I am not aware whether thermometers, barometers, rain gauges, and other instruments for conducting and registering meteorological observations are usually supplied by Government to hospitals occupied by European troops, but there are none attached to the military department at this station. All such observations, if any, are made by private instruments.

Question 1. SANITARY CONDITION OF STATION.—4th. I have applied to the Executive Engineer, Public Works Department, through the Deputy Assistant Quarter-Master-General of the division, for a map of tracing of the station, with the country round, showing the position of the bazaars, public buildings, villages, &c., &c., but have failed to obtain what I want, his excuse being that he has no establishment of surveyors to make maps of the country round each station in his division, and that he is too much occupied with his other duties to make them himself.

I have, &c.
(Signed) HENRY KENT, Major, 77th Regt.,
Commanding at Ghazeepore.

The Quarter-Master-General of the Army, Simla.

UMBALLA.

Accommodation	Queen's Troops	Artillery	2 Troops Horse Artillery—90 each	180	2,162
			1 Company Foot Artillery	132	
		Cavalry—1 Regiment		828	
		Infantry—1 Regiment		1,022	
	Native Troops	Cavalry—1 Regiment		560	2,328
		Infantry—2 Regiments		1,768	

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The aspect of the surrounding country is level, well cultivated, and studded at intervals with trees. The view is bounded on the N. and E. by hills; the country is flat, sandy in some places, and dry. There are no swamps near the station. There are a considerable number of trees both isolated and in clumps, but there is very little jungle or water. 2. The elevation of the station above the sea is 1,050 feet; but it is on a level with the adjacent country. The Gujgur river is the nearest water; the exact elevation of the station above it, however, is not known. There is no higher or healthier ground adjoining the station. 3. The nearest mountain land is the Himaleh, about 35 miles from the station. The crest of the nearest range at Kussowlie, attains a general elevation of 6,250 feet above the sea, and 5,200 feet above the station. 4. The Gujgur river, which is the nearest water, is about 5 miles from the station. The nullahs in the vicinity, as a general rule, contain no water except immediately after rain; the vicinity is liable to overflow of water. This occurs generally in the rains; but it runs off rapidly, sometimes in a few hours. There are ravines and broken ground in various directions in and near the station; but their effect on health is not perceptibly injurious. They ought, however, to be filled up, and one clean cut waterway established, especially in the vicinity of the Native infantry hospitals. 5. There is much tree vegetation in the station; but there are regulations in existence which are from time to time enforced to prevent it from interfering with free ventilation. There are no other impediments of any moment either within or without the station. The temperature of this station is less raised by exposure to reflected sun heat than that of most other stations in India. There is a grassy surface for the greater part of the year, that modifies the amount of reflected heat. The station is not exposed to cold or variable winds, or to the sea breeze, and the hot land winds that prevail at one season of the year are not unhealthy.

UMBALLA. BENGAL.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	6. The surrounding country is cultivated. There is no irrigation beyond that from the wells, and that is not allowed within a mile of the station; this is not observed to have any effect on the health of the station. There is very little rice cultivation in this part of the country, and none within several miles of the station. Neither indigo, hemp, nor flax is cultivated or prepared near the station, consequently there is no nuisance or injury to health experienced from them. 7. The large native city of Umballa lies about 3 miles to the westward of the station. 8. The geological structure of the surface is light clay and loam, with a sandy admixture, in some places pure sand, and in others sufficiently argillaceous to retain the water, and cause considerable evaporation. The subsoil is composed of alternate beds of light clay and sand, not sufficient to prevent percolation. The station occupies new ground. 9. Water is found at an average of about 30 feet below the surface both in the wet and dry seasons, and at some places within half that distance. 10. For the most part the rainfall of the district flows readily away; there are no surface springs. In some of the sandy spots the water sinks into a pervious subsoil, and so drains away; it nowhere oozes out again near the level of the station. In some spots there is considerable surface evaporation. There is no higher ground near the station, and the bases of the hills are at too great a distance to drain into the subsoil of the station. 11. The water supply of the station is derived from wells. The tank surface in the station approaches 400,000 square feet. Only two of these tanks, however, were intended for storing the water, the rest are excavations from which materials for building have been taken. They contain more or less water generally throughout the year, but two of them are liable to get dry during May and June. They contain no plants, and few, if any animals; and none of them are used for drinking purposes. The wells are not liable to pollution from leaves or other matter falling into them. All stagnant water gives out malaria under certain conditions of the atmosphere, and the alternate filling and drying of these earthen tanks must to a certain degree produce it. The remedy is to fill up all that are not required, and make the rest of solid masonry. 12. The amount of water supply available at the station is very limited indeed; it varies with the seasons. In the hot weather the majority of the wells are nearly dry. The water in its sensible properties is for the most part pure, free from colour, taste, and smell. No complete chemical analysis of it has ever been made; it is hard and contains carbonate of lime in considerable quantity. It is good and not injurious to health, but its amount is very far from sufficient. It is raised by Persian wheels and by the hand, and distributed to the European troops by a masonry channel, and to them and the station generally by men employed for the purpose. A better supply could be obtained from the Gujgur river, and it would be a matter of great importance to the station to have it done. 13. No answer to this question. 14. With respect to the manner of selecting sites for new stations some rules are to be found in the Public Works Code of 1858, page 82, and also in the General Order G.G. of 8th August 1853. The committees for this purpose are directed to consist of 2 military, 2 medical, and 1 civil officer, with the executive engineer. All intelligent medical officers are aware of the conditions necessary for a healthy site, but no selection should positively be made till an officer of scientific acquirements has lived a year on the spot. He ought to keep during that time a complete series of meteorological observations, and he ought to be able to report that the site is well raised and easily drained, the surface of green sward, the surface soil porous, the water level at least 20 feet from the surface, with an intermediate subsoil that admits of ready percolation. Also that there are no evidences of previous malaria in the inhabitants, that the vicinity is free for miles from swamps, floods, rank vegetation, and objectionable cultivation, or that there are ready means of getting rid of all these. That the water supply is pure, wholesome, and abundant, and that large trees to a wholesome extent exist.
II. CLIMATE.	1. There are no instruments for conducting meteorological observations at the station except the thermometer and rain gauge. 2. Twelve meteorological registers are transmitted. The following Table is from June 1851 to May 1852.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Max. Sun Temperature.	Rain.	Winds.		Days of Sunshine.
										Directions.	Force.	
1851.		°	°	°	°				In.			
June	28·710	96·6	37	113	76	—	—	117	$1\frac{8}{10}$			
July	28·771	87·	34	108	74	—	—	122	$7\frac{16}{10}$			
August	28·810	90·7	24	100	76	—	—	122	$3\frac{2}{10}$			
September	28·809	91·7	35	100	65	—	—	126	—			
October	29·060	84·3	44	98	54	—	—	128	—			
November	29·158	67·2	43	84	41	—	—	100	$2\frac{5}{10}$			
December	29·191	62·4	39	76	37	—	—	89	$\frac{3}{10}$			
1852.												
January	29·172	59·8	44	81	37	—	—	89	$\frac{13}{10}$			
February	29·114	69·7	40	86	46	—	—	95	—			
March	29·015	67·	34	84	50	—	—	91	$7\frac{3}{10}$			
April	28·971	82·7	47	101	54	—	—	104	$\frac{18}{10}$			
May	28·871	89·	47	109	62	—	—	113	$2\frac{7}{10}$			

3. The climate of the station is a generally healthy one. It is dry and hot for three months of the year, moist and hot for three more, temperate for two, and cold and bracing for the remaining four; it is neither variable nor foggy, and is not influenced either by irrigation or tree planting. The atmosphere, however, of the entire district is more or less affected by dust from April till July. Like all Indian climates its influence on the health of the troops from April till October is debilitating under all restrictions and provisions. The diet during

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	that period should contain less animal food, and the clothing ought to be of the lightest description, with flannel next the skin during the rains. Parades and drills should be confined to the first hour and a half after daybreak, and large airy buildings should be erected for the indoor recreation of the men, both physical and mental. February is the most healthy, and July the most unhealthy month. The prevailing diseases are fevers, rheumatism, bowel and liver complaints. 4. The hill districts are generally more healthy than the station, and their distance may be said to extend from 40 miles upwards. Their facilities for drainage are complete, but the water supply generally limited or difficult of access. There are many reasons for their adoption (the chief of which is reduced temperature), and few against it which will not disappear when they are better understood and more easily reached. 5. The following are the stations at which I have served, viz., Calcutta, Barrackpore, Dum-Dum, Dinapore, Mullye, *Ghazapore, *Benares, *Mirzapore, Cawnpore, *Meerut, *Dehra-Doon, *Umballa, and Lahore. Those marked with a * were comparatively healthy, but Dinapore, Cawnpore, and Lahore were positively injurious.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station and surrounding country, with a ground plan of the barracks, are transmitted. 4. Table of barrack accommodation. Date of construction, 1843. Total number of rooms or huts in each barrack, 21. Total number of non-commissioned officers and men, 2,162.

Barracks.	Regulation Number of Men in each Room or Hut.	Dimensions. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet for each Bed.	Height of Men's Beds from Floor.	Windows. Number.	Height.	Breadth.	Remarks.
European Infantry Lines.		Ft. In.	Ft. In.	Ft. In.						Ft.	Ft.	
Nos. 1, 2, 3, and 11 Barracks:—												
Main Rooms - 3 {2 / 1}	66	57 0 / 53 0	24 0 / 24 0	23 6 / 23 6	32,146 / 29,892	1,427	60		—	—	—	Constructed in 1843; reconstructed and improved in 1857.
Verandah Rooms - 10 {4 / 6}	33	35 0 / 30 8	12 0 / 12 0	15 6 / 15 6	6,510 / 5,704	1,726·5	118		—	—	—	
Serjeants' ditto - 8	1	20 0	9 9	15 6	3,022·5	3,022·5	195		1 in each room.	4	2	
Nos. 4, 5, 6, 7, 8, and 9, Barracks:—												
Main Rooms - 3 {2 / 1}	66	56 6 / 53 0	23 0 / 23 0	23 6 / 23 6	30,538 / 28,646	1,359	58		—	—	—	21 rooms in each.
Verandah ditto - 10 {4 / 6}	33	35 0 / 30 8	12 0 / 12 0	15 6 / 15 6	6,417 / 5,704	1,811	117		—	—	—	Barrack regulation number of men 197.
Serjeants' ditto - 8	1	20 0	9 9	15 6	3,022·5	3,022·5	195		1 in each room.	4	2	
No. 10 Barracks:—												
Main Rooms - 3 {2 / 1}	66	57 0 / 53 0	24 0 / 24 0	23 6 / 23 6	32,148 / 29,892	1,427	60		—	—	—	—
Verandah Rooms - {4 / 4}	33	33 0 / 36 0	24 0 / 24 0	15 6 / 15 6	5,115 / 5,580	1,550	110		—	—	—	—
„ „ - 2	—	27 0	10 0	15 6	4,185	—	—		—	—	—	—
Serjeants' „ - 8	1	20 0	10 0	15 6	3,100	3,100	200		1 in each room.	4	2	—
European Cavalry Lines.								Two feet.				
Nos. 1, 2, 3, 4, 5, 6, 7, 8, and 9 Barracks:—												
Main Rooms - 2	30	85 0	24 0	21 6	43,860	1,462	68		—	—	—	Constructed in 1843; 14 rooms in each barrack.
Verandah ditto - 4	12	78 0	12 0	15 0	14,040	1,170	78		—	—	—	
Serjeants' ditto - 8	1	20 6	10 9	15 0	3,305	3,305	220		1 in each room.	4	2	Regulation number of men, 50.
Horse Artillery Lines.												
Nos. 1, 2, and 4 Barracks:—												
Main Rooms - 2	40	86 0	24 6	21 6	44,376	1,109	51		—	—	—	Constructed in 1846.
Verandah ditto - 4	12	81 0	12 0	14 6	14,094	1,174	81		—	—	—	Number of rooms in each barrack 14.
Serjeants' ditto - 8	1	20 6	11 6	14 6	3,418	3,418	235·75		1 in each room.	4	2	Regulation number of men, 60.
No. 3 Barrack:—												
Main Rooms - 1	26	75 0	24 0	27 0	48,600	1,869	69		—	—	—	Destroyed by fire and reconstructed in 1859.
„ „ - 1	22	63 0	24 0	27 0	40,824	1,856	69		—	—	—	
„ „ - 2	26	75 0	12 0	20 0	18,000	693	35		18	4	2	Number of rooms, 10.
Verandah ditto - 2	22	63 0	12 0	20 0	15,120	687	34		—	—	—	Regulation number of men, 100.
Serjeants' ditto - 4	4	20 0	12 0	20 0	7,200	300	60		—	—	—	
Foot Artillery Lines.												
2 Barracks:—												
Main Rooms - 2	40	86 0	24 0	21 6	44,376	1,109	51		—	—	—	Constructed in 1847–48.
Verandah ditto - 4	12	81 0	12 0	14 6	14,094	1,174	81		—	—	—	Number of rooms, 14.
Serjeants' ditto - 8	1	20 6	11 6	14 6	3,418	3,418	23·5		1 in each room.	4	2	Regulation number of men, 60.
Guard Rooms.												
European Infantry.												
Main Rooms - 1	12	38 0	20 0	24 0	18,240	1,520	64		—	—	—	Constructed in 1843.
„ „ - 1	8	24 0	20 0	24 0	11,520	1,440	60					
European Cavalry.								Two feet.				
Main Rooms - 1	12	40 0	20 0	20 0	16,000	1,333	66		—	—	—	Constructed in 1843.
„ „ - 1	6	24 0	20 0	20 0	9,600	1,600	80					
„ „ - 1	4	18 0	20 0	20 0	7,200	1,800	90					
Artillery Division.												
Main Rooms - 1	24	70 6	24 0	20 6	34,686	1,445	70		—	—	—	Constructed in 1848.
„ „ - 1	8	24 0	24 0	20 6	11,808	1,476	72					
Prison Cells.												
Cells - - - 5	1	8 0	10 0	14 6	1,160	1,160	80	2 feet.	26	3	1 6	Constructed in 1847–48.
„ - - - 2	6	27 0	10 0	14 6	3,915	625·5	45	„				
„ - - - 1	4	17 6	10 0	14 6	25,375	639·4	44	„				
Guard Room - - 1	12	34 0	18 0	14 6	8,874	739	51	„				

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. In the main rooms there are no windows, they are all doors on opposite sides opening inwards. In the non-commissioned officers' rooms there are windows, which also open inwards. There are double verandahs on both sides, the dimensions of which will be found in the plan transmitted; one of the inner verandahs is used as a sleeping apartment. There are neither jalousies nor jhilmils. 6. The cots are usually of salwood, 2 ft. high, with bottoms of country tape or canework. The bedding consists of cotton sheets, a quilt stuffed with cotton, a blanket, and a carpet, the size of the cot. In barracks there ought to be substantial iron cots, 20 inches high, 3 feet broad, and 6½ feet long. In tents straw ought always to be supplied as bedding, and a piece of painted canvass, or something impervious to moisture, ought to be laid over it for each man. 7. The tents are rectangular in form, and made of cotton cloth. The dimensions are, length, 20 ft.; breadth, 16 ft.; height, 10 ft. Sixteen men are the complement for each tent, and the above dimensions would give 200 cubic and 20 superficial feet per man. 8. The barracks and guard rooms are ventilated by the doors and by roof ventilators only. Tents in India have no artificial ventilation, nor have the huts of the native soldiers. The ventilation in the barracks at Umballa is tolerably efficient, but it could be improved by raising the walls of the centre rooms, and placing ventilators in them between the roof and the verandahs. A judicious system of ventilating crowded tents is still a desideratum. The barracks are cooled by tatties, which are light bamboo frames made to fit the doors, and over them is spread a thin aromatic root. This, when moistened and exposed to the hot west wind, which blows through it, cools the air agreeably inside. They are only available, however, for cooling purposes from the time the hot winds commence till the rains set in. The cost is 8 rupees per 100 square feet. 9. All the barracks at Umballa are built of burnt brick and lime mortar, except those of the infantry, some of the inner walls of which have mud cement. Tents are constructed of cotton cloth, tape, bamboos, and rope. The roofs of the barracks are either tiled or thatched, and the verandahs are terraced. 10. The floors of the barracks are principally of burnt brick, an objectionable mode of construction; they are raised above the ground about 1½ feet, but there is no passage of air beneath. 11. Burnt bricks and lime mortar are the most suitable materials for the construction of barracks in India. The floors ought to be raised on arches and flagged with stone, and there should be wall ventilation high up, which is wanting in the Umballa barracks. A non-absorbent material as plaster is also a desideratum both in barracks and hospitals. The materials of which tents are constructed cannot be improved; they want nothing but means of ventilation in bad weather when overcrowded. The barracks and cantonments are kept in repair by the executive engineer, and repairs are executed whenever called for. The senior medical officer at the station is *ex officio* sanitary officer, and the quartermaster-general's department is responsible for the sanitary state of the cantonment. The walls and ceilings of the barracks are cleansed and limewashed annually. 12. A sketch of the men's lavatories, &c. is transmitted. There is to be one lavatory with urinal attached, for each barrack. The greater number are now being built, and they are supplied with water from the wells. 13. A sketch of the barrack cook-houses is transmitted. The means provided for cooking are copper utensils tinned inside monthly by the commissariat. The whole question of cooking for the European soldiers is open to much improvement. Water is carried to the cook-houses from wells, and the refuse water is sometimes carried away, but more generally is thrown outside, and is absorbed or evaporates according to the season. The artillery have a tank about 400 yards from the barracks, where much of the washing is done. The washermen of the other regiments carry the clothes to the Gujgur river, where they are washed once a week. The means are sufficient. 14. A sketch of the privies and urinals is transmitted. They are drained into a shallow masonry cesspit just outside the building, which is cleaned every day and the contents conveyed in carts beyond the limits of the cantonments. 15. The privies and cook-rooms are ventilated by doors and openings in the walls. The barracks at night are lighted by oil lamps enclosed in lanterns, and hung from the ceiling. The regulation allowance is six of these lights per 100 men. Two lamps in each barrack are supplied to burn all night. 16. The barracks are drained by surface drains; but they are not of masonry; there are no masonry drains or sewers at Umballa. There is a natural fall in the country from right to left, and also in front and rear of the barracks, and the surface drains are merely kept open and free from rubbish and vegetation. Surface water and the drainage from the lavatories, baths, cookhouses, &c. disappear with tolerable rapidity, by the drains and by percolation. That from privies, urinals, &c. is carried away in carts, but increased conservancy means are required for this latter part. No part of the barrack buildings or hospitals is damp; in the former some leakage occurs from the roof ventilators, but this can be remedied. There are no cesspits properly so called; the only approach to them are the masonry receptacles for the urine, &c. Their contents are carried away daily and never absorbed into the soil. The distance of the urinals and wash-houses from the men's quarters is about 150 yards; they are cleansed daily and their contents removed in carts. There are several nullahs in and near the station which can never in my opinion be kept in a satisfactory state, till their bottoms are metalled as you would do a road. Almost every fall of rain cuts them away in some part, destroys the slope, and permits water to lodge; their extent, too, is so great that their conservancy is a matter of the greatest difficulty. 17. The general state of the surface cleansing is satisfactory. The refuse, manure, &c., are carted out of the station daily, or every second day, to the extent that the conservancy establishment can effect. Improvements in that respect affecting officers' compounds, &c., have lately been proposed. 18. The surface of the cantonment is kept free from all rank vegetation. There is nothing that obstructs ventilation in any material degree in the station. The numerous trees are what require most attention, and they are looked to from time to time. 19. The station bazaar is regularly laid out in squares or rectangles, and intersected with broad roads, which admit of tolerable ventilation in it. The drainage might be improved, but, on

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station —*cont.*	the whole, it is clean as a bazaar, and well kept, though crowded in some parts. The water supply is defective. There are 2 large public latrines, but two more are required. The regulations having reference to bazaars are to be found in the Public Works' code. The sanitary establishment consisted of 28 sweepers, paid by the inhabitants; but it was doubled in one day at the request or order of the cantonment magistrate without a complaint, showing the elastic nature of his resources. Native houses can never be kept perfectly clean; but in the bazaars of the station cesspits or dungheaps found without them subject the owners to fine, and they are consequently kept tolerably clean. There is no nuisance experienced in the barracks from wind blowing over the native dwellings. 20. Only one place is allowed for the slaughtering of animals. It consists of two divisions: one where the cattle and sheep for the soldiers are killed, and the other for the station and bazaars generally; it is about 400 yards to the rear of the Suddur bazaar. The regulations regarding it are that animals shall only be killed over-night or in the early morning; that the blood and offal shall immediately be removed by sweepers, two of whom are entertained for each division; and that everything offensive shall be carried beyond the cantonment boundary. All this is done, but the offal is thrown into a nullah, and left to be disposed of by birds and beasts, the bones remaining on the surface; it would be an improvement to bury it. There is no nuisance experienced in the station from this place. 21. There are no regulations for stabling or picketing bazaar horses, or those of camp followers. All that is looked to is that the owners of these horses shall allow no dung or filth to accumulate where these animals are kept, or be fined in default. 22. The stables for the artillery and cavalry belonging to the station are open sheds with tile roofs supported on pillars, with roof ventilation from end to end. In the artillery, they are 220 yards in the rear of the men's barracks, and 480 yards from the hospital; in the dragoons, they are 300 yards in the rear of the barracks, and 400 yards in front of the hospital. The light and ventilation are ample. The dungheaps are close by the stables, and the manure is carted away every day, or, at latest, every second day, out of the limits of the cantonments. The picketing ground for the artillery and cavalry horses belonging to this station are arranged just outside, and between the rows of stables, and are, consequently, at the same distance as the stables from the barracks and hospitals. 23. In the artillery and 27th regiment of foot there are sufficient quarters for married non-commissioned officers and men; but in the dragoons, not quite enough for all the married men. No married people at this station occupy the same barrack rooms with the men.
Officers' Quarters.	1. The officers' quarters are for the most part good bungalows, ventilated by large doors. The compounds or grounds surrounding them are well drained. Arrangements are required to ensure the soil and filth of these compounds being conveyed out of cantonments, for this, if done at all, at present is done imperfectly. I would recommend that a small monthly sum should be levied on the occupant of each bungalow, to defray the cost of filth carts for this purpose, and that the officers should be held responsible that all impurities are removed.
IV. Health of the Troops.	1. The station, district surrounding it, and the adjoining native population are, as a general rule, healthy. 2. There are no statistics to show what diseases are most prevalent among the native population; but endemic fevers with spleen disease occur, though in a modified degree, as compared with other districts. Epidemics are rare. 3. The district is naturally well drained by rivers; the soil and subsoil favourable to percolation; there are few swamps; the extreme hot weather is short in duration, and the cold weather is bracing and healthy. 4. The H. A. came from Mean Meer. They had been there 11 months, and had been healthy, and are so still; their principal diseases were, and are, fevers and venereal. The F. A. came from Saugor; had been there two and a quarter years; suffered much from intermittent fever and spleen disease; arrived here on the 19th May, 1859 and suffer still from the sequelæ of those diseases. The 7th hussars landed from England on 30th November 1857, and were in the field till their arrival here on 8th April 1859; the most prevalent diseases are fevers, venereal, and diarrhœa. The 27th foot had been at Peshawur from December 1856 till March 1858, and suffered much from fevers of malarious origin. They arrived here in September 1858, and suffer still from the same diseases, but are much improved in health. The Loyal Poorbeah regiment were at Palam for eight months, and arrived here in February 1859; they were healthy there, and are so still. The Kelat-i-Ghilzie regiment from Jullundur arrived here September 1859. The 6th irregular cavalry are from Mooltan. The European infantry barracks have been the most unhealthy, caused by inferior buildings and greater crowding; they have been much improved recently. 5. The troops at the station are not camped out at any period of the year. 6. I have never been actually in charge of troops at a hill station, but I lived for nearly seven years within a few miles of the hill stations of Mussoorie and Landour. I am of opinion, that to troops arriving in health the climate of those stations is highly favourable, provided they are lodged in good barracks. The effects in some states of disease are not favourable, but that is too wide a question to be answered here. 7. I do not believe that residence in a hill climate predisposes men to any diseases on their return to the plains. All the instances bearing a semblance of it that have come to my knowledge, are capable of a much more rational explanation otherwise. I have no proof, however, that it is protective beyond the temporary effect that more robust health would produce. 8. I approve of selecting hill stations for troops, and I believe, under proper precautions, they are destined to be of the greatest advantage to European troops in India. 9. There are no diseases that can be strictly called peculiar to hill climates, with which troops going to them are liable to be attacked; but diseases prevail in some of them at certain seasons, from which troops have often suffered severely. 10. Dry, spacious, and well-ventilated barracks have been the great want up to the present time, a want which is only now commenced to be remedied; this is the first and most essential point calling for attention. Arrangements also are required for a full supply of vegetables, for the men, another want that has been productive of much mischief. Flannel next the skin, and especial attention to warmth about the abdomen and extremities, in the rains, with many other minor points, can be arranged by the local authorities.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	11. To healthy men none of the seasons in the hills are inimical. To men who have suffered from disease in the plain, the hot and cold seasons as a general rule are the best adapted. The period of such residence which would enable troops to obtain full benefit to their health depends much on the state of health in which the men are sent up, and the disease. I would recommend that accommodation should be provided in the hills for at least one-third of the number of European troops serving in India. I would give every regiment 3 years out of 9 in the hills at least. 12. So far as my experience goes there is no period of residence in the hills likely to prove injurious to troops on returning to service in the plains, but they have never been allowed to remain long enough to test this; on the contrary short and interrupted residence of sickly regiments has been the rule, and the results have unfairly been allowed to stand as evidence that such is the case. I would point to the prolonged lives and the physical and mental energy that have returned to the shattered constitutions of our invalid officers who reside there as a proof to the contrary. 13. There are no special precautions for protecting the health of troops on leaving hill stations for the plains beyond what is enforced for protecting the health of the men cantoned in the plains. 14. To preserve the health of troops serving in India I would locate them in the hills with short periods of service in the plains. The march I believe to be generally beneficial, but frequent change of station has no other advantage. The excitement and novelty are said to interest the men, but they are too short lived to be of any benefit. 15. Both barrack and hospital arrangements have hitherto been utterly insufficient, but improvements in this respect are now going on. The new barracks and hospitals at Subathoo and Kussowlie leave little to be desired but their completion. 16. Elevations of from 7,000 to 8,000 feet above the level of the sea are the most suitable for hill stations for healthy men; at such an elevation it is almost immaterial what kind of country the site overlooks. The climate is temperate in the hot and bracing in the cold weather, but in the rains, no doubt, such a site is obnoxious in an increased degree to the evils of clouds and damp, and in some parts of the hills to bowel complaints also, but, as I have said before, under proper precautions healthy men would not suffer much from any of these. Suitable sites, as far as accessibility is concerned, and other military reasons, must be looked for at lower elevations, and probably convalescent stations also such as would suit diseases of the bowels and confirmed organic disease generally. 17. The various ranges of the Himalayah mountains are near the station, and many parts of them could be advantageously occupied as hill stations. No survey or selection of new sites has recently been made, but many are doubtless available at different elevations. 18. I have found stiff and retentive surfaces unhealthy unless thoroughly drained, but it is fair to say that other causes may have been at work at the same time. A soil and subsoil that will admit of ready percolation to a depth of 10 or 15 feet at least, is however, the one to be selected. 19. Soldiers should not proceed to India before the age of 20 or 21, the latter is preferable, and they should land in India in November. To preserve the health of the recruit when landed in India, I would move him off at once from presidency towns, which are hot-beds of all that is injurious to the young soldier, and avoid great fatigue and exposure at first to the sun. If they march, ascertain that the commanding and medical officers are alive to the following evils, viz. late marching, a crowded column of march, deficient or excessive clothing, irregular and unwholesome diet, and intemperance, especially with bazaar spirits. Above all have lock hospitals at every station, and keep them as nearly free as possible from diseases which ruin the constitution. 20. With respect to the advisability of sending troops direct from home depôts to India, or first to intermediate stations, we must refer to the health statistics of regiments that have come to India, after service at the Cape, at Australian Colonies, Ceylon, the Isle of France, &c., to decide. I have some doubts of any acclimatising benefits from intermediate service, but I have not sufficient personal experience to enable me to speak decidedly on the point. Experience does not show that the death risks to the young recruit are greater in the earlier than in the succeeding years of service. The points to be avoided are exposure and hard service before his frame is consolidated, and sending him at first to an unhealthy station. My experience points to the latter as the great danger to be avoided. I speak moreover from analogy, when I say that the two first years spent in the hills would be advantageous to all troops recently arrived, especially to the young. 21. The mode of transport from the port to the interior is by steamer to Allahabad and Mooltan, or intermediate stations, from thence by rail, bullock-train, or dak-carriages; very few troops have of late been allowed to march up. The chief precautions necessary are to move them in warm weather only during the night, and provide them good shelter during the day, and to have regular establishments at each halting-place, to provide good food, and all other requisites for them. 22. Experience goes to prove that a regiment of infantry would die out and be renewed in 20 years' continued service. Some improvement is now to be hoped for; but I would for the present confine the service of the British soldier in India to one-third of the above period, or under great emergency to half at the very utmost. 23. In stations, the mode of conducting medical boards is such as to avoid conflict of opinion as regards invaliding. At presidencies, it gives boards there the power to upset all previous decisions, while they have in all probability less information on the case to guide them, the surgeon of the man's regiment being absent. I have not, however, found the evil of sufficient magnitude to call for a remedy. 24. Troops leaving India for home, if going by the Cape, should leave in all January; if overland, before the middle of April.
Diseases.	1. In the 27th foot, there are inspections every Saturday; in the hussars, at irregular intervals; in the artillery, when specially ordered; and in the Native troops, none. 2. There has been no case of true scorbutic disease at this station. In a few isolated cases, a spongy state of the gums has been detected; but it cannot be classed as scorbutic. There are no preventive measures I could suggest. 3. The proportion of cases of hepatic disease usually under treatment, is between two and three per cent. generally. It very frequently succeeds to fevers, and in some cases is traced to direct exposure and intemperance. The state of fatty degeneration doubtless succeeds to

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	too high living, and too much animal food, without exercise in the hot weather. The prophylactic measures necessary are, the means of taking in-door exercises in the hot weather; occupation, mental and physical; freedom from all crowding in barracks; a scale of diet adapted to the seasons; and the absence of exposure and spirituous liquors, &c. 4. There is no case of dracunculus at Umballa. 5. The proportion which the constantly sick from venereal diseases bear to the total sick in hospital, is 27·38 per cent. among the European troops. It would be highly advantageous if a larger proportion of married men were allowed. Lock hospitals would in the highest degree be advantageous, and to aid them, let the women select one of their own number as their head. Make her position desirable by good pay, and make her responsible that no diseased woman goes undetected. 6. The troops at this station suffer from fevers. Endemic fevers of miasmatic origin, and intermittent and remittent. Dysentery. Often one of the sequelæ of the above. Cholera. Sporadic cases, rarely epidemic. Small-pox. Ditto ditto. Rheumatism is frequent. 7. The more frequent zymotic diseases are fevers, intermittent in character, and quotidian and tertian in type. Profluvia and impetigines. The two former are prevalent mostly in and after the rains, and the latter at all seasons. Moisture, cold, and terrestrial exhalations generally accompany their appearance. We have no statistics to prove that these diseases prevail more in one part of the bazaar than in another, and there is no trustworthy testimony to be obtained. The vital statistics of bazaars and native dwellings are entirely wanting. Among the poorer part of the native population there are many conditions that predispose to these diseases; they are ill fed, ill clothed, exposed to all the vicissitudes of climate as well as such malarial influences which exist, their personal habits also all tend in the same direction. The troops are exposed to none of these. 8. Epidemic disease is seldom seen in the station, and is little influenced by the soldier's duties or occupations in barracks, though his personal habits may, and doubtless in many instances do, determine the severity of individual attacks. 9. Small doses of quinine as a prophylactic have been tried only by one medical officer at present at the station, and he reports unfavourably of the practice, or, to speak more properly, he has been disappointed in the results. 10. No answer to this question.
V. Intemperance.	1. As a general rule the soldiers at this station are temperate. There are three or four confirmed drunkards in the artillery, the same number in the 7th hussars, while in the 27th foot only four men have been tried in two years for habitual drunkenness. 2. The proportion of admissions into hospital from diseases directly caused by intemperance is about 3 per cent., and indirectly about 15 per cent. There are no available statistics to show the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station. Drunkenness is invariably punished as an offence. 3. Rum is sold in the canteens and native spirits in the bazaars by a contractor. The quality of the former is good, but that of the latter highly injurious. The artillery consume three-quarters of a gallon per month per man, and the hussars at the rate of $1\frac{5}{31}$ drams per man daily. Spirit forms no part of the soldiers' ration in any situation; they can purchase it at the canteen, but not before 1 p.m. No dram is allowed before morning parade. In the artillery brandy has been given in minute quantity, and largely diluted, to convalescents in cases of impaired digestion, but very rarely. In the other regiments distilled spirits are not given to convalescents, they are allowed at the utmost to draw an allowance of beer or porter. No injurious drinks other than intoxicating drinks are sold in the canteens, but a kind of ginger beer is often procurable in bazaars, which becomes injurious in cholera seasons, or when a tendency to bowel complaints exists. 4. The consumption of spirits by troops is injurious to health, and is not conducive either to the efficiency or internal discipline of the corps. 5. Spirits form no part of the ration, but it would be beneficial to the health of the troops to abolish the sale of them in canteens and bazaars, and allow nothing to be sold but malt liquor. 6. The abstract question as to the comparative effect on health of spirits and malt liquor or wines is a wide one, but in a practical point, as regards the soldier, and used as he uses them, there can be no doubt of the evil effects of spirituous liquors as compared to the other two. 7. Tea, coffee, lemonade, soda water, &c. are much used at the station, and the effects of all as compared with spirits may safely be pronounced favourable, but as compared with malt liquors in moderation I am not prepared to say that they can claim the same superiority. 8, 9, 10. There is no spirit ration, but I am of opinion that it would be beneficial to suppress the sale of spirits and substitute beer, tea, coffee, &c. 11. Copies of the canteen and bazaar regulations are transmitted. The canteen regulations are enforced; but it requires constant supervision to see those of the bazaar anything like obeyed.
VI. Diet.	1. The composition of the ration for Queen's British troops and European troops is the same, and as follows:—viz., meat (beef or mutton) 1 lb., bread 1 lb., rice 4 ozs., sugar $2\frac{1}{2}$ ozs., tea $\frac{5}{7}$ oz., or coffee $1\frac{3}{7}$ oz., salt 1 oz., vegetables 1 lb., and firewood 3 lbs. The periodical changes are from beef to mutton, and *vice versâ*, in the vegetables as the seasons change, and the men vary their own diet occasionally by the purchase of fowls and other items. There is a daily inspection of the ration in all the regiments by the orderly officer and regimental quartermaster, and by the commanding officers at intervals. There is also a monthly inspection of the things that are kept in store by a board of officers. 2. A complete ration with vegetables is provided, but no fruit. The stoppage is *5d.* or 3 annas 4 pie per man. The soldier has three meals a day, viz., breakfast at 8 a.m., consisting of tea or coffee, and bread and meat, generally fried or curried. Dinner at 1 p.m., consisting of soup, meat, (roast, boiled, or curried,) rice, potatoes when procurable, bread and vegetables. Tea at sunset, consisting of tea and bread. The allowance of vegetables to the daily ration is 1 lb.

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References to Subjects and Queries.	REPLIES.
VI. Diet—*cont.*	3. I would modify the ration by reducing the amount of animal food to one half its present allowance from May till October, and substituting a milk diet for the part retrenched. I would give all encouragement for the production of such native vegetables as can be grown during the hot months, when the want of vegetables is much felt. The rations for a company or mess are for the most part made over to a non-commissioned officer or mess orderly; but no precautions are found necessary for preventing the rations being disposed of. 4. There are two cooking-houses for the artillery and one for each troop or company of the rest of the troops at the station. The apparatus consists of copper vessels tinned inside, iron or copper frying pans, and iron spits. As regards cleanliness, light, and ventilation, the kitchens are open to improvement. The water supply is sufficient for cooking purposes only. The food is generally roast, stewed, or eaten as steak, but each man can order his food to be dressed as he likes it. Commanding officers at present at this station report the cooking as satisfactory, but it cannot in reality be considered so. The great majority of the cooks are ignorant of the first principles of the art, and I am satisfied it would add much to the health of the soldier in India if a class of men were properly taught and trained for this purpose. The men have tea, coffee, or other refreshment either before a march or half way, generally the former. During a march in the hot weather it has been found advantageous to give the men a substantial meal at two and three in the morning before march. Some regiments during the late service in the hot weather ate a hot breakfast at that hour with good effects. 5. Gardens could be advantageously established near the station in the cold weather, but so far as my experience goes, soldiers will not work voluntarily in them to an extent that would render the exercise healthful or the products valuable to themselves. Regulations might be framed, rendering the work in the garden an offset against some other part of the soldier's duties, and all be obliged to take it in turn. As regards health, the regulations would effect the following points:—1st.—Situation, so as not to be too near the barracks to affect the health of the men, or too far to be conveniently reached; 2nd.—Avoiding excessive irrigation; 3rd.—Keeping down excessive vegetation, especially in the rains; 4th.—Forbidding manure heaps and other causes of unwholesome emanations; 5th.—Appropriate times for the men to work, both as regards seasons, and the hours of the day, &c. &c.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress is as follows:—Flannel shirt, shirt, cotton drawers, cotton and worsted socks, boots, braces, tunic, jacket, helmet, or shako, helmet forage cap, cloth forage cap, gloves, overalls, great coats. In the cold weather the outer garments are of cloth, and in the hot of light cotton cloth dyed kaki. The accoutrements are a pouch, and pouch and sword belts. I consider the present dress as suitable to the climate, and for the soldier's duties by day and night. The present loose dress is well adapted for India. A light helmet with a double crown, and a white cover would be desirable for the hot weather, as the pith helmet, though a good protection against the sun, is none against rain unless supplied with an outer cover impervious to wet. Men on guard have the protection of guard rooms against sun and wet. Sentries have generally a verandah or some cover in their beat.
Dutie .	1. Recruits should be thoroughly drilled at home before proceeding to India. Enlist them at 18 or 19, drill them for two years at home, and send them out men, capable of bearing fatigue and ready to take their place in the ranks, instead of boys unfit for the working duties of actual service. The drill necessary for the recruit has to be undertaken in the first hot weather, and they stand it badly. 2. The duties consist principally of guards and parades, and stable duties for the mounted branches. The drill is confined to 1 hour or 1½ hours in the early morning, from half an hour before to an hour after sunrise (in the cold weather this period is increased), and in the evening three-quarters hour. The men do not suffer in health from the drills and duties at this station. The best hours for drills, parades, &c., are from 7 to 9 in the cold weather, and from 5 to 6 in the hot, with half an hour in the cool of the evening. March so as to reach your ground by 9 in the cold weather, and about sunrise in the hot. General Order, March 21st, 1846, sec. 2, page 361, Military Regulations. The artillery have 5 nights in 6 in bed, Hussars, 7 out of 8, 27th foot, 10 out of 11, Kelat-i-Ghilzie regiment, 5 out of 7, and the Loyal Poorbeah regiment 6 out of 8. 3. Guards are all mounted close to the men's barracks, and they are 24 hours on duty. There are generally three roll calls during the day, but none at night; in some instances check roll calls on uncertain days. Night guards are not injurious to health if the men have five nights in bed. Flannel next the skin is necessary during the rains and cold weather, and the only other precautions required are against cold and wet.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation at this station, viz., ball-courts, skittle-grounds, schools (but no trained schoolmasters), library and reading-room, well lighted, but no day room, or soldiers' clubs. There is a soldiers' garden; government provide tools and seeds, but few men take much interest in it. There are neither workshops, theatre, nor gymnasia. Lofty spacious buildings for these as well as for a day-room, are much required. They would add greatly to the health, comfort, and amusement of the men during the hot weather. With the exception of the library, none of the means at this station are available for the occupation or amusement of the men, during the heat of the day in the hot season. There are restrictions on all the European troops exposing themselves during the heat of the day, on pain of confinement, in the hussars, between breakfast and 5 p.m.; artilleay, between 9 a.m. and 4 p.m.; and 27th foot, between 7½ a.m. and 5 p.m. These restrictions are beneficial to the health of the troops. 2. I would erect large airy buildings near the barracks for the indoor recreation of the men, during the long days of the hot weather. A part ought to be set aside for games of all kinds, and a part for a library, reading-room, coffee-room, workshops, theatres, &c. In the coffee-room, tea, coffee, beer, to a limited amount, and a pipe ought to be procurable. Plunge baths under the same roof would be a great advantage. 3. The institution of soldiers' savings banks here would be advantageous. 4. There is not sufficient shade from sheds, verandahs, &c., and exercise during the day in hot weather cannot be taken under the shade of trees without injury to health.

References to Subjects and Queries.	Replies.
IX. Military Prisons.	1. There is no uniformity in the military prisons in the station; the cubic space allotted to prisoners, extending from below 800 to above 3,000 cubic feet. Improvements in the ventilation of some have recently been made, and are still required in others. Verandahs in some have also been applied for to modify the heat, and others are quite uninhabitable in the hot weather, and are not used.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2. The actual powers of the medical officer as regards the conduct of a march, &c., are, I believe, *nil*; but I have always found the practical working of his recommendations satisfactory. It depends much, however, on the officer commanding, for he has the power of setting aside those recommendations, and acting in direct opposition to them. In this case, of course, he takes an increased responsibility on himself, and is held solely answerable for any evils that may ensue. 3. In ordinary marches in this presidency, encamping grounds are marked out along all the principal lines of road, and no other selection allowed. Their conservancy is well cared for, but they become impure to a certain extent after long use under any regulations. Where camping grounds have to be selected, it would be an improvement, if a medical officer were directed to accompany the officer who selects the ground the day before, and to advise with him in this duty. It would also be an improvement, if medical officers had the power of interdicting absolutely unhealthy spots, unless there were the strongest military reasons against him. 4. The arrangements for field hospitals are made by the principal medical officer with the army. Doolies are the general (and by far the best) mode of transporting the sick; ambulances also are supplied, and the hospital supplies are generally transported on camels. Copies of regulations bearing on these matters are to be procured from the presidency office.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1. A sketch of the ground plan and elevation of the hospital is transmitted. 2. The position of the hospitals, as regards the distance from barracks and the stables, is as follows:—In the infantry, on the left rear of the men's barracks, about 400 yards distant; in the cavalry, on the left rear angle, and 300 yards from the stables; in the artillery, in rear of the park, and quite detached; and in the native regiments in the rear of each. They are at a distance from all bazaars, but not at a great distance from officers' houses. The sites are open and freely ventilated, and there are no buildings or other obstructions to interfere with ventilation. The sites are healthy as regards elevation, drainage, absence of malaria, &c., with the exception of the native infantry hospitals, where foul nullahs run in close proximity. These require to be filled up, and one clear cut for the water made. 3. The water supply is wholesome, but very limited indeed. A small canal, brought into cantonments from the Gujger river, would appear to be the only feasible remedy. 4. The facilities for drainage require little artificial assistance. There are surface drains cut in the soil, but the refuse water of hospitals is carried away. 5. The lowest wards of the hospital are raised 3½ feet above the ground, but there is no perflation of air below. The ground being metaled on a slope all round the building, the roof water is rapidly carried away into side channels, which communicate with a natural nullah, 1,500 yards from the building. This surface drainage is sufficient for carrying away the rain-fall rapidly from around the hospital. The hospitals are built of burnt bricks and lime cement, but in some portions the cement is mud. The walls and roofs are not double, but are sufficiently thick to keep the hospital cool. The main wall is from 2 to 2½ feet thick, and the others 1½ and 2 feet. The artillery and cavalry hospitals are thatched, and the infantry one is tiled over two layers of bricks. There are verandahs on both sides 10 feet wide, but an additional 2 feet in width would have added much to the shelter they afford from the sun. The inner verandahs are frequently used for the accommodation of sick, convalescents, and others. The hospitals consist of one flat.

Table of Hospital Accommodation.

Date of construction of European infantry hospital, 1859; European cavalry hospital, 1845; and artillery division hospital, 1846.

Total number of wards, 31.

Total regulation number of beds, 356.

Hospitals.	Regulation Number of Men in each Ward.	Dimensions. Length.	Breadth.	Height.	Cubic Contents.	Superficial Area in Feet for each Bed.	Cubic Feet per Bed.	Height of Men's Beds above the Floor.	Windows. Number.	Length.	Breadth.
		Feet.	Feet.	Ft. In.	Feet.			Feet.		Feet.	Feet.
European Infantry.											
Main wards 5 -	16	52	24	24 0	29,952	78	1,872	2	44	4	2
End „ 4 -	2	18	12	17 0	3,672	108	1,836	2	—	–	–
European Cavalry.											
Main wards 8 -	24	72	24	24 0	40,672	72	1,695	2	One in each ward.	4	2
End „ 8 -	2	18	12	17 0	3,672	108	1,836	2			
Artillery Division.											
Main wards 2 -	24	72	24	21 6	37,152	72	1,548	2	One in each ward.	4	2
End „ 4 -	3	25	12	15 0	4,000	100	1,500	2			

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The hospitals are so placed as to receive the full benefit of the prevailing winds. There are windows to one hospital only, and they are constructed on the revolving principle on a central axis. The arrangement is highly conducive to ventilation, and ought to be extended to the other hospitals and the barracks also. 6. In the new infantry hospital the ventilation is effected by doors and the windows above mentioned, in the others by doors and ridge roof ventilation. The wards are always kept pure from odour and closeness, but the addition of windows would aid ventilation much. There is also a ventilating shaft in the new infantry hospital, of which a plan is transmitted. Jalousies or jhilmils have not been supplied to all the hospitals. Those in existence are 8 feet by 5; a double row of imbricated boards, that admit the air, and modify the glare, wind, &c., when required. 7. Tatties, as before described, are the means used for cooling the air admitted into the wards, together with the thermantidote, a circular arrangement of fans for throwing in fresh air, previously cooled by passing through a tattie at the side of the machine; they are worked by manual labour. 8. The walls and ceilings of hospital wards are limewashed to the height of 6 feet every quarter, and entirely once a year, but it can be done oftener, if considered necessary, and an application made for it. 9. The privies are detached buildings from the corner of the rear verandah in each hospital, and communicating by a covered way, and are constructed of the same materials as the hospital. A plan is transmitted. The fluids are received into shallow masonry cesspits, which are cleaned twice a day, and the whole soil and filth are carted out of cantonment daily. Much attention is given to keep them clean and free from all offensive smells. 10, 11. The lavatory arrangements of the hospitals are as follow:—Bathing rooms with basins ranged all along the wall, some of brass, some earthenware, and bathing tubs are supplied, in which cold and warm baths are given. Inexpensive means of giving hot, cold, and vapour baths might be arranged in every hospital. The above applies also to the means of bathing for the sick. 12. Washermen to the required number are kept up by Government for the hospitals. The clothes for the most part are washed and dried out of the station; the work is efficiently performed, and I do not know that it could be improved upon. 13. In the artillery hospital there is properly speaking no store room, but a spare room is made available without interfering with hospital arrangements. In the hussars the storage is sufficient, but in the 27th regiment rather confined. 14. The cots supplied are not of a standard or uniform pattern; they are generally of wood with tape or cane bottoms. The bedding is of red cotton cloth filled with country tow. Substantial iron bedsteads with tape bottoms would be a great improvement on the wood. The covering consists of sheets and country blankets, as many as may be necessary. 15. The kitchens are detached buildings in the rear of the hospitals, and from 40 to 60 yards distant. The means of cooking consist of copper vessels tinned twice a month, and kept very clean; means of boiling, roasting, frying, stewing, &c. are provided, and puddings and extra diets also. Much cannot in general be said in praise of the cooking, but it is sufficient. 16. The diet tables, diet rolls, &c. are the same in all regiments, and copies can be supplied from the head offices at presidencies for the two services respectively. Copies of all the returns recently called for in the royal army are not yet available at this station. 17. One hospital serjeant is allowed to each European hospital, and sick orderlies are also furnished from regiments to attend on serious cases. No nurses are provided in regimental hospitals beyond two native women for the female wards, and in smaller hospitals such as those of brigades and battalions of artillery they are not allowed to be permanent but are indented for when required. One European nurse at least ought to be allowed for every female hospital. With this exception the attendance for the sick is ample and liberal. 18. The sanitary condition of the hospitals is satisfactory. No epidemic diseases have appeared in the wards. 19. The deficiencies which have come under my notice are, 1st, a left wing hospital for the infantry regiment; 2nd, means of isolating infectious cases in all the hospitals; 3rd, a privy for each of the female hospitals; and 4th, baths as before mentioned. 20. The commissariat furnish carts, elephants, and extra doolies on requisition, or on indent for the exercise of convalescents. There is also sufficient ground round each of the hospitals, but shaded walks and seats are not in existence. 21. There are separate buildings (females' hospitals) for the treatment of soldiers' sick wives and children. A privy is required for each, but estimates have been sent in for this necessary addition. 23. The powers of the medical officer in matters relating to the sanitary state of the hospitals consist in representing improvements required, and the same as regards repairs of buildings. These representations, bearing the signature of his commanding officer and of the deputy inspector-general of hospitals, are passed on to the proper department to be carried out. As regards diet and medical comforts, his powers within the hospital are complete, under the supervision of the deputy inspector-general of hospitals. 24. There are no wards or hospital for convalescents; they would be useful as enabling the surgeon to regulate the diet, exercise, and exposure of convalescents; but they cannot be said to be urgently required.
XIII. BURIAL OF THE DEAD.	1. The burial ground for British troops is in the station, in the rear of the dragoon bazaar and to leeward as regards the prevailing wind. 2. It is 900 feet by 700, giving an area of 630,000 square feet. The soil and subsoil are those of the station generally before mentioned; it is well drained, and the ground carefully kept. 3. With regard to grave space and the interval between the graves, there are no specific regulations; no depth for the graves is laid down. They are never re-opened, and not more than one body is interred in the same grave. Interment is not compulsory at any time, but is seldom delayed beyond 24 or 48 hours. There are two burying grounds for native troops, about 400 yards in the rear of the native hospitals; and a space close beside them for burning the dead. One is a Mussulman, and the other a Hindoo burying ground. 4. The grave yards at this station are never offensive. British troops are generally buried within 24 or 36 hours after death.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead—*cont.*	5. There are four Mussulman burying grounds altogether, but only one for Hindoos, and many of the latter burn their dead in a nullah outside the cantonments. An additional burying ground ought to be marked out for the Hindoos of the Sudder bazaar. 6. No perceptible injury from the present practice accrues to the public health of this station. 7. The improvements I would suggest with regard to the disposal of the dead are, that the place of incremation for the Hindoo dead be removed to a greater distance, and the Mussulman graves should be much deeper.

(Signed) R. Garrett, Major-General, Commanding Division.
H. A. Bruce, M.D., Deputy-Inspector-General of Hospitals, Sirhind.
A. K. Moffat, Captain, Executive Engineer, Lower Sirhind Division.

1st August 1860.

PESHAWUR.

Accommodation
- Queen's Troops
  - Artillery: 2 Troops Horse Artillery (Bengal), 5 Companies Foot Artillery - — 732 non-commissioned officers and men.
  - Infantry: Barracks for 2 Regiments, but 2½ Barracks in each lines are unfinished, so that there is actual accommodation for - - — 1,919 non-commissioned officers and men.
- Native Troops
  - Cavalry: Lines for 1 Regular and 2 Irregular Native Cavalry.
  - Infantry: 5 Regiments of Native Infantry, 1 Company Sappers and Miners.

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the valley of Peshawur is flat, with sufficient undulation to render the drainage lines marked and decided. In its natural state, the country would be dry, but the free use of water for irrigation renders the cultivated parts of the valley moist. There are no woods or jungle near the station; even single trees are scarce, except near the irrigation canals. There is a good deal of water in the vicinity, which is drawn from the larger rivers for the purpose of cultivation. 2. The station of Peshawur is 1,056 feet above the level of the sea; Nowshera is 1,014 feet, and the cold weather level of the Indus at Attock is 874 feet above the sea level. The ridge on which Peshawur cantonment is located is about 68 feet above the depression which separates it from the next undulation, and about 70 feet above the jheel or marsh, which is the nearest body of water. There is no higher or healthier ground adjoining which would be available for a station, as most of the neighbouring hills are beyond British territory. 3. The mountain of Tarturrah, to the right of and overlooking the Khybor Pass, is about 16 miles distant from the station, and about 5,600 feet above it. 4. The nearest standing water is the jheel, which is mostly within the cantonment boundary, and about three quarters of a mile from the inhabited part. The nearest running water, independent of the small canal which runs through the station, is the Barah river, distant about four miles. The Cabul river is about six miles off. The vicinity is not liable to overflow of water. There are ravines and broken ground beyond the limits of the station; when these are made receptacles of filth and stagnant water they cannot but be injurious to health. None exist within the limits of the cantonments, and those that exist outside the station are so far from it that the health of the troops is not affected by them. 5. The station is open and freely exposed to such winds as circulate in the valley. The trees within the station are trimmed to such a height as to allow free circulation of air, and there are no high walls to interfere with ventilation. The temperature of the station is raised by reflected sun heat. This fact can be sensibly felt by going some distance out of the station after sunset in the hot weather. It is not exposed to cold or variable winds. During the cold season the wind blowing off the snow is naturally sharp, but it has no injurious effect on health. 6. In the immediate vicinity of Peshawur the country is cultivated, but throughout the valley there is much uncultivated land. There are numerous water channels or irrigation cuts from the Bara river intersecting the country to the very boundary of the cantonment. Indeed, the stream which supplies water to the station is one of these. When not carried to any great extent, artificial irrigation is not injurious, but if carried to the extent required for the cultivation of rice, maize, or bajra, it would probably affect the health of those living near. The cultivation of rice is prohibited within three miles of the cantonment boundary. The cultivation of indigo, flax, and hemp is not carried on in the Peshawur valley, or if it be, it is so distant from the station as not to have any effect on health. 7. The city of Peshawur, which is large and populous, is within 1½ miles of the station. 8. The soil of the district is a peculiarly stiff non-absorbent clay; underneath are beds of gravel and small shingle, which overlie a bed of boulders. In this last stratum water is found. The cantonment was formerly cultivated land, and remarkable for its fertility; rice was the principal crop raised. Two small villages stood on the site of the present left irregular cavalry lines, but they covered a very small portion of the present cantonment area.

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References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	9. The water level in the wells does not vary in the wet or dry season. The depth of those in the station to the water line is about 102 feet. Those wells are on the ridge, not in the valley. 10. The stiff clay soil of the station is almost impervious to water, but the slope of the ridge is sufficient to carry off all rain fall. Unfortunately, most of the natural drainage lines in front of the cantonment lead into the jheel, which is formed by the embankment of the Sheikh ka Kutta canal crossing and closing the drainage outlet of the country. No drainage from higher ground passes into the subsoil of the station. 11. The principal water supply is derived from the river Barah, and is conducted into the cantonment by a small open canal. This river is never totally dry, much of the water is probably derived from the melting of the snow on the Sooféd Koh, under which it takes its rise. Most of the native lines have a small tank, about 30 feet square, in which they allow the water to settle before using it; this gets rid of much of the impurities which the water holds in suspension. These tanks are filled every day. They contain numerous frogs, but there are very few plants either in them or the water-courses, as they are frequently cleaned, Typha angustifolia, Potamogitons, and Confervæ. The following statement is made by Dr. J. L. Stewart, 14th P. I. "The higher grounds in the immediate neighbourhood of the marsh are abundantly covered with several species of Salsolaceæ (anabisis Suædah), Frankinia pulverulenta, and similar species of plants that affect saline soils, and there is a profuse saline efflorescence on the surface of the ground in these places, the water of the marsh at one place being quite salt. The willow, which is abundantly propagated by means of shoots in many places near the marsh (and with a shrubby salt-loving Tamarix is the only tree) is probably Salix Babylonica. The ordinary plants which grow in and about the marsh are as follows:— " Epilobium; occasional. " Lycopus; abundant in parts of marsh. " Lippia nodiflora and Herpetis monneira about ditches. " A species of Utricularia; rare. " Eclipta erecta; not uncommon when not stagnant. " Ranunculus aquatilis and R. Sceleratus; common in places. " Limnanthemum cristatum; in one part of marsh only. " A species of Lium; common in some ditches. " Typha angustifolia; abundant. " Nelumbium; common (cultivated) in some parts. " Butomus; rare. " Sagittaria sagittifolia and Alisma Equisetum debile; occasional. " Two species of Juncus; rare. " Of sedges the following are common:— " Cypicus exaltatus and C. Mucronatus, Malacochæte pectinata, Scupus Maritimus, Carix Wallichiana (rare), and Eleocharis palustris. "The common grasses about and near the water are Agrostis alba, Polypagon monspeliensis, Andropagon Bladhii, and Cynodon dactylon, with an Arundo and a Saccharum. "The following are the floating and submerged plants:— " A species of Ceratophyllum (C. demersum?), Potamogeton crispus, common in streams; P. Pusillus, not common; and P. Plantageneus (?), rare. " Hydrilla verticillata; Marsilea quadrifolia; Chara, most abundant; and Nitella (?), occasional. " Confervæ; profuse. " Two species of Riccia, a Semno, and an Argolla; in abundance in various parts of the marsh." Owing to constant stirrings and renewal of the water in the tanks and canals of cantonments, almost the only plants that are to be found in them are the Typha angustifolia, two Potamogitons, and Confervæ, and these are very uncommon. No tank used for drinking purposes is used for bathing, great care being taken to prevent the water from anything tending to defile; leaves of trees do fall into the tanks, but they are cleaned out so frequently that no harm ensues, and the water is not injured. Drainage is never allowed to flow into the drinking tanks. No malaria proceeds from the drinking tanks, because they are always kept full of water, and free from decomposing vegetable matter. 12. The supply of water at the station is about 15 cubic feet per second: the water has no peculiarity, in either taste or smell, but the colour is affected by the quantity of earthy particles held in suspension, and varies from pale grey to a deep red, the latter being caused by heavy rain in the hills. There are no means available for analysing the water to ascertain its chemical or microscopic character. No artificial means are used for raising and distributing the water; it flows in earthen channels on the surface of the ground. Better water could not be obtained, but a system of filtration should be adopted to purify it by mechanical means. The filtering strata might be boulder stones, kunker, gravel, and charcoal. 13. With regard to other topographical points not included in the above, may not the basin-like position of Peshawur have some effect on the health of the valley? Being completely surrounded by hills, it has not the advantage of a free circulation of air, and any one who has been there for some time cannot but have remarked the stagnation of the atmosphere at certain times. Again, the latitude of Peshawur, 34′ 4″, is considerable, and change in temperature from day to night very great. In September and October this cannot fail to affect the men exposed to night duties. 14. In former years sites for cantonments appear to have been selected without much regard to the topography of the country. If the position were relatively high, it was supposed the station must be healthy, as it had facilities for drainage, but at the present time, other points formerly deemed of little importance, receive due consideration, such as nature of the soil, whether light and absorbent, or clayey and retentive of water, nature of vegetation, quality of drinking water, depth from the surface, prevailing winds, medical statistics gathered from the local inhabitants, &c. In choosing sites for hill stations, elevation, climate, differences produced by different aspects, and the disposition of the surrounding hills, humidity of the atmosphere, &c., have their weight,

References to Subjects and Queries.	Replies.
II. Climate.	1. There is a set of instruments at the station for meteorological observations, which were supplied by Government about two years ago, and a register of the temperature is carefully kept by the staff surgeon. 2. The following is a table of meteorological observations.

From 1st January 1859 to 31st December 1859.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
	Inch.	°											
January -	28·95	51	17	59·5	42·5	51	43·5	—	1·4	E.,S.E.& N.W.	—	—	Cold, cloudy, and several showers of rain.
February -	28·77	51	13	57·5	44·5	51	47·5	—	3·1	N.,N.E.& S.	—	—	Cold, generally cloudy, with rain.
March -	28·775	65	14	69·	55·5	65	63	—	1·2	E.,N.E. & N.W.	—	—	Beginning of month cloudy, with drizzling rain, latter part clear, hot during the day.
April -	28·75	74	15	79·5	64·5	74	73	—	0·7	E.,N.E.&W.	—	—	Several showers of rain during the month.
May -	28·615	85·5	18	91·	73·	85·5	72	—	0·9	Variable	—	—	Dust storms and rain first part, latterly close and oppressive.
June -	28·325	93	16	99·	83·5	93	85·5	—	0·9	E.,N.W. & W.	—	—	Hot and oppressive up to 15th, rain on 16th, 19th, and 20th.
July -	28·415	91	14	95	81·5	91	82·5	—	2·39	N.E. & Ny.	—	—	Heavy clouds and strong wind at times.
August -	28·472	88·5	16	96·06	80·3	88·5	78·5	—	0·02	Nrly. & N. Easterly	—	—	Cloudy in middle of month, days cooler than usual.
September	28·462	84·9	17	90·5	73·9	84·9	71·2	97·8	0·11	N.,N.W. & N.E.	—	—	Days hot and oppressive, nights cool, cloudy at times.
October -	28·440	73·7	21	84·5	63·5	73·7	63·5	96·5	—	N.E. & N.	—	—	Hot during the day, latter part cloudy.
November	28·583	59·5	16	65·75	49·5	58·7	51·5	87·25	1·5	S. & S.W.	—	—	Cloudy, particularly latter half.
December	28·80	48·6	16	57	41·75	48·5	44·81	74·75	1·01	S.,S.W. & N.W.	—	—	Rather cloudy.

3. The climate of Peshawur is exceedingly trying to weak constitutions, chiefly from the great alternations from heat to cold, and from dryness to moisture. Tree planting appears to have done a good deal towards equalizing the temperature by preventing that fierce heat which used to mark the station, but without carefully registered data for several years past, all remarks on this point must be received with caution. The canal which runs through this station does not appear to be conducive to malaria; nor is irrigation from it allowed to produce rank vegetation. The presence of water doubtless tends to increase the humidity of the atmosphere, but in the present case not to an injurious extent. The air is generally free from dust. It is the variableness of the climate that chiefly affects the health of the troops. The diet at present given to the men is excellent, and requires no change. Every attention is paid to clothing. It is very advisable that the times of drill should in the hot season be confined to the very early morning between gunfire and sunrise, but in the cold weather the troops should not be turned out until after breakfast. The most healthy months are December, January, February, March, and April, and the most unhealthy months September and October, fevers and bowel complaints prevail.

4. There appears to be no more healthy spot near the cantonments where a station would be advantageously placed. Cherat, in the Khuttak range of hills, about 20 miles distant, was at one time much talked of as a desirable site, but the civil authorities objected to its occupation.

5. The following are the stations at which I have served, with observations on their comparative salubrity :—

Calcutta, Dum Dum.—Generally healthy, but no crowding in barracks should be allowed.
Cawnpore.—Fevers and dysentery prevail.
Agra.—Generally fairly healthy.
Delhi.—Formerly healthy, but latterly not so.
Ferozepore.—Generally healthy.

III. Sanitary Condition of Station.

1, 2, 3. Map and plans of the station, with ground plan of the barracks, are transmitted.

4. Table of Barrack Accommodation.

Date of construction of Barracks, 1853–7.

Total number of rooms or huts :—

——	For Single Men.	Non-Commissioned Officers.	Families.	Guard Room.	Cells.
Artillery Lines - -	28	56	48	4	12
Right European Infantry -	36	72	24	4	16
Left „ „ -	44	64	15	4	16
Total - -	108	192	87	12	44

PESHAWUR.
BENGAL.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
Artillery Lines.		Feet.	Feet.	Feet.	Feet.			Feet.		Ft.	Ft.
Horse Artillery Single Men	24	66	24	24	30,680	1,320	66	2	8	2	4
Non-Commissioned Officers and Families	1	14 / 14	8 / 12	20 / 16	4,928	4,928	280	2	2	2	4
Foot Artillery.											
Single Men	16	14	24	20	21,120	1,320	66	2	6	2	4
Non-Commissioned Officers and Families	1	14 / 14	8 / 12	20 / 16	4,928	4,928	280	2	2	2	4
European Infantry.											
Single Men	24	66	24	20	30,680	1,320	66	2	8	2	4
Non-Commissioned Officers	1	14 / 14	8 / 12	20 / 16	4,928	4,928	280	2	2	2	4
Families	1	2 rooms each 18	13	16	7,488	7,488	468	2	—	—	—
Guard Room	12	60	13	15	11,700	975	65	2	—	—	—
Prison cells	1	13	8	11	1,144	1,144	104	—	—	—	—

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. In the European barracks the doors are opposite each other, and open down to the ground. The ventilating windows in the upper part of the wall swing on horizontal pivots, and are opened and shut by ropes. The barracks are surrounded by a closed verandah 12 feet wide, and an open outer verandah of the same width. The verandahs are never occupied as sleeping quarters during the hot months, but in the winter it is sometimes found necessary to put a few men in the inner verandah. There are no jalousies or jhilmils. 6. The bedsteads are of wood, strung with hempen twine or a sort of grass rope; both of which materials are good. No alteration appears necessary in these or the bedding, which consists of a mattress stuffed with cut hemp (in hospitals only), wadded quilts, sheets, and a country blanket, with a suttringee. 7. Sixteen men occupy each tent. The tents are all of the same pattern, and are known as the "European privates' tent;" they are composed of canvass supported by two uprights and a ridge pole, and have a door on each side. The cubical contents are 2,280 feet, and the superficial area, 320 feet. The cubic space per man is 142½ feet, the superficial area per man is 20 feet. 8. The flat roofed buildings have generally ventilating shafts or chimneys at the corner of the rooms, as well as upper windows, opening and shutting by a string. Pitched roofs have ventilators under the ridge pole, as well as upper windows. The ventilation is in every case sufficient. In the barrack rooms tatties are the only artificial means employed for cooling the air. The proportion of tatties for a barrack or guard-room is one tattie to every two openings. 9. The Peshawur barracks are built of bricks, either burnt or unburnt, according as the barrack is termed a permanent or temporary building. Tents are generally made of three folds of white cotton canvass, and lined with blue. 10. The floors are all of brick, the main ward floors being three bricks, or 9 inches thick; the dining wards, two bricks, or 6 inches thick; and the outer verandah, either one brick over lime rubbish, or refuse of kilns 9 inches thick beaten to 6 inches. This makes a very good verandah floor. All floors are raised; never less than 2 feet, and in some instances as much as 5 feet, but this is due to the inequality of the ground. There is not a free passage of air beneath. 11. It is an undisputed point that unburnt brick buildings are cooler than burnt brick ones; and in this station the barracks with mud roofs are undoubtedly cooler than those with tiled roofs. The materials best suited for buildings in this station are burnt bricks for walls, and pitched roofs covered with mud. The barracks are kept in repair by the executive engineer. Repairs are here not so quickly or so readily executed as at other stations where there is a greater command and consequent competition of skilled labour. The deputy assistant quartermaster-general is, under the brigadier commanding, responsible for the sanitary state of the cantonment. The walls and ceilings of barracks and guard-rooms are cleansed and lime washed annually; those of the hospitals, once in six months. 12. There are as yet no wash-houses for the European soldiers at Peshawur, but a plunge bath is made in each set of lines. 13. Water is readily supplied to the cook-rooms from the nearest channel. The refuse water runs into cesspools, which are emptied out daily. The washing and drying of linen is performed by native washermen outside the limits of the cantonments. 14. The privies are cleaned out daily, and the urine runs into cesspools which are emptied every day. The urine and ordure are carried beyond the limits of the cantonments, and there buried. 15. The cook-rooms and privies are ventilated by openings under the roof, and by several openings in the walls. Those at present in the station have neither doors nor windows, consequently there is a free circulation of air. The barracks are lighted at night by lanterns suspended from the roof. 16. There is no system of sewerage at Peshawur. Offensive matter is received into cesspools which are daily cleaned. Rain water is carried away by surface drains into the natural drainage outlet of the country. Situated on a ridge, as Peshawur cantonment is, the surface drainage must needs be good, and where it is not so, the cause is traceable to local holders; these are being gradually filled up or efficiently drained. The drainage may be considered

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	good. There is no dampness in any of the buildings. The fluid refuse of barracks is received into cesspools, which are daily cleansed. The cesspools are about 3 feet deep and 3 feet wide. It is impossible to state their position from the nearest well or tank, as each building which requires it has one of its own, but in no case is the cesspool sufficiently close to taint the water; moreover, they are to be made more absorbent, which will remove all possibility of such a thing happening. There are no foul ditches in or near the station. 17. The surface cleansing is satisfactorily performed by a conservancy establishment kept up for the purpose. It is done daily, and the refuse manure, &c., are carted to a sufficient distance from the cantonments, and thrown into existing pits or ravines. 18. The surface of the cantonments is kept free from vegetation, except grazing grass, which is permitted and even encouraged. There are no old walls, thick hedges, &c., sufficiently high to interfere with the ventilation of the station. 19. The station bazaar enjoys the same advantages from situation as to drainage as the rest of the station. The ventilation is free, water supply ample, and cleanliness strictly enforced. There is but little crowding, as a large portion of it is unoccupied. Every attention is paid to cleanliness and sanitary measures in the Sudder bazaar generally, for which an establishment is kept up. The drains are not good, but are kept clean, and no accumulation of filth is allowed. The native houses in the villages round the station are not dirtier than native villages usually are, and it is probable they have dung-heaps inside their enclosures. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. The slaughter shambles are at the extremity of the cantonment, as far as possible from the inhabited part. Offal is not allowed to become offensive, as it is generally eaten by pariah dogs and other natural scavengers. The shambles are not a nuisance to the station. 21. The horses of camp followers, if residents of the station or regimental bazaar, are picketed in those bazaars. The ponies belonging to the irregular cavalry grass cutters are tethered in the rear of the horse lines. It would not be possible to picket horses outside the cantonment unless a strong guard were furnished, for the people of the neighbouring hills are great horse thieves, and succeed occasionally in taking them even from officers' compounds. The picketing places are kept clean according to the conservancy rules of the station. 22. There are no artillery or cavalry stables at Peshawur; the horses are picketed within 100 yards of the artillery barracks. Most of the stable litter is used in the riding school, and the remainder is carried beyond the cantonment boundary. 23. There is sufficient accommodation at the station for the married families; they do not occupy the same rooms with single men.
Officers' Quarters.	1. There are no officers' barracks. Officers live in detached houses, each having a small garden round it. These compounds are generally well drained, and the houses are ventilated by upper windows. Rank vegetation is not permitted in the gardens. No improvements are suggested.
IV. Health of the Troops.	1. During the past two years and up to this time (July 1860), the station has been comparatively healthy; there is no European population out of the station. I believe also that the native population of the surrounding district has been in a more healthy condition than formerly, but it is difficult to obtain any reliable information on the latter point. 2. Intermittent fevers, bowel complaints, and rheumatism are the most prevalent diseases among the natives. Small-pox generally prevails as an epidemic towards the end of the cold season. In the Ensufzae and Hazara districts a severe form of remittent, assuming a typhoid type, and attended with jaundice, occurs at times as a severe and fatal epidemic. Spleen disease does not prevail to any great extent. 3. Judging from the physical appearance of the natives of the district, I consider them a well-grown, healthy race. I allude to the rural population: it is different with the inhabitants of the large densely crowded city of Peshawur, with its narrow dirty streets and ill-ventilated houses. 4. The following table will show the stations at which the troops were before coming here, with the length of their service there, and date of arrival at this station; also the state of health and diseases from which they suffered there, their state of health on arrival here, and the prevailing diseases since then.

Regiments.	Name *of former* Station.	How long there.	Date of leaving it.	State of Health there, *and Diseases from which* chiefly suffered.	Date of Arrival here.	State of Health on Arrival.	Diseases from which chiefly suffered since Arrival.
7th Batt. 11th Brig. R.A.	Rawul Pindi.	5 months	7 Oct. 1858	Not good; fever; dysentery.	28 Oct. 1858	Improved	Fevers; dysentery; venereal.
3rd Troop 2nd Brig. B.H.A.	Mean Meer	4½ years	7 April 1858	Good; cholera -	—	Good	Fever.
3rd Comp. 2nd Batt. B.F.A.	Lahore -	5 years -	10 Jan. 1854	Good; none recorded -	—	Good -	Intermittent fever and bowel complaints.
3rd Comp. 6th Batt. Ditto.	Ferozepore	5 years -	4 Mar. 1858	Very good; fever; rheumatism.	—	Good -	Ditto, ditto.
Right Wing 7th Royal Fusiliers.	Jhelum -	1 year -	25 Oct. 1859	Good { Fevers; bowel complaints; venereal and liver	{ 8 Mar. 1859	Very good	{ Fevers; bowel complaints; venereal.
Left ditto, ditto -	Rawul Pindi	1 year -	28 Oct. 1859	Good { diseases.	{ 5 do.		
98th Regiment -	Nowshera -	½ year -	—	Good; common continued fever.	—	Excellent	Ditto, ditto.

The eastern end of the cantonment has been by some people pronounced more unhealthy than the western, but the ratio of sick between the corps stationed at opposite ends varies so that it is impossible to say with certainty that one part is more unhealthy than another.

5. The artillery generally move out into camp at Chum Kunnie, about eight miles from the station, for practice, during part of the cold season. They usually remain in camp for six weeks or so, and I believe the men are all the better for the change.
6. I have never been in charge of troops at hill stations.
7. Data are wanting to show whether troops resident for some time in hill stations are more or less liable to attacks of febrile disease on returning to the plains, but men who have gone to

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	hill sanitaria labouring merely under debility after an attack of fever or other acute disease, and who have derived full benefit from the renovating climate there, will, it is believed, be less liable to those attacks. 8. I highly approve of hill stations for troops. 9. The diseases which troops are liable to be attacked with on going to hill stations are chiefly bowel complaints. 10. No reply to this query. 11. From April to November is the best season for residence in hill stations, and that is the shortest period of residence to obtain any benefit therefrom. 12. Experience seems to prove that a residence in the hills protracted beyond two years tends to injure the constitution. 13. The troops should not leave hill stations for the plains until the cold weather has decidedly set in. 14. As a rule it appears that it would be more generally conducive to health to locate troops in the plains, giving them short periods of service in the hills. Frequent change of station is very desirable. 15. With regard to barrack and hospital accommodation, the experience of any of those deputed to reply to these questions only extends to Murree, and there the accommodation is ample. 16. The most suitable sites for hill stations are obtained at an elevation of from 4,000 to 7,000 feet above the level of the sea. 17. There is no higher spot near the station that could be advantageously occupied as a hill station. 18. No answer to this question. 19. I consider 20 the best age for a soldier proceeding to India. The best period of the year for troops to land in India is about the end of October or during November, as the heat has become moderated by that time, even in the southern parts of India, where the ports are situated, and there is ample time for the men to arrive at the most distant stations during the cold season. Recruits on arrival should join their regiments at once. 20. The Cape of Good Hope would be a good intermediate station to which to send troops. It might be beneficial to locate young regiments on landing on hill stations for the first two years. 21. Troops arriving at Kurrachee for Peshawur usually travel by river steamer as far as Mooltan, and thence by regular marches 10 or 12 miles a day. They are well looked after and are healthy on march. 22. Men arriving in India at 20 years of age may, I think, serve efficiently for at least 22 years. A furlough of two years to Europe, including the passage home and out, after 10 years' service would be beneficial. 23. No experience of invaliding boards. Those convened at stations for selecting invalids act harmoniously, and, I think, efficiently. 24. I consider that invalids leaving India for home should embark at any time from the middle of January till the middle of February; they would thus arrive in England after the severity of winter had passed over.
Diseases.	1. Weekly health inspections of Europeans are made. Natives are not inspected. 2. Scorbutic disease is now rare; only three cases are recorded amongst the European troops of the station during the past year. In some previous years, 1855, 1856, and 1857, H.M.'s 87th Regiment suffered a good deal from scorbutic disease. This is attributable to the want of fresh vegetables formerly. The supply is now abundant. 3. The proportion of hepatic diseases under treatment varies much. When other diseases prevail extensively it is low, sometimes as low as 0·76 per cent. During the past year, which has been a generally healthy one, the proportion of hepatic to all other diseases treated has been 4·133 per cent. The average of five years is 1·847 per cent., and from this circumstance it would appear to be not generally the consequence of other disease. The natives do not suffer much from hepatic disease. Abstinence from spirituous liquors would, I conceive, be the best prophylactic. 4. Dracunculus is almost unknown amongst Europeans at the station, only one case being on record during a period of ten years. The natives suffer occasionally from it. 5. The proportion which the constantly sick from venereal disease bear to the total sick from all other diseases, of course varies much, being small during otherwise unhealthy seasons, and *vice versâ*. I have seen it as high as 28·50 per cent. The average per cent. of venereal cases to strength is 1·015. I consider that the establishment of well regulated lock hospitals would be advantageous. At present the women have no place of refuge to which they can resort when diseased, and therefore cannot forego the only means they have of obtaining a livelihood. 6. Fevers generally prevail to a considerable extent; but less during the two past years than formerly. The most common forms are— Fevers.—Febris inter. quot. „ „ tert. remittent. contin. com. Dysentery.—Dysentery, acute and chronic, is of frequent occurrence. Cholera rarely appears as an epidemic. Small-pox is of rare occurrence amongst the European and native troops; but it frequently appears as an epidemic in the city of Peshawur and the neighbouring villages. Rheumatism is of frequent occurrence amongst both European and native troops at the station. The following shows the proportion which admissions and deaths from these diseases bear to the total admissions and deaths :—

Diseases.	Admissions.	Deaths.
Fevers	44·90	22·85
Dysentery	3·34	14·28
Cholera	0·17	10·11
Small-pox	0·35	4·31
Rheumatism	2·45	„

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	7. Fevers of the intermittent, remittent, and continued types, which form by far the most numerous class of diseases at Peshawur, are remarkable on account of the extreme prostration that often attends them, in former years assuming frequently the typhoid form. Small-pox, dysentery, diarrhœa, &c. exhibit no peculiarities at this station. In May ephemeral and simple continued fevers sometimes prevail; but the admissions from the more severe forms of fevers and dysentery are generally most numerous in August, September, and October, sometimes extending over the cold months of November and December. Rheumatism is most frequent in the cold season, at which time there is usually a good deal of rain and stormy weather. Sudden changes of temperature, also a long continued high range of temperature, accompany or precede the appearance of these diseases. The sanitary condition of all parts of the station is pretty much the same as regards cleanliness, drainage, water supply, &c. The personal habits and conditions among the troops or native population do not appear to have any effect in predisposing to the above diseases. 8. If the soldier is exposed to excessive fatigue or harassing duty in the field, he will certainly, it is presumed, be rendered thereby more susceptible of an attack of any prevailing epidemic; but his ordinary duties and occupations in barracks, with the exception of night guards, do not produce liability to such attacks. 9. Small doses of quinine have not, as far as I can learn, been tried as a prophylactic. 10. Doubtless the draining of the marsh in the vicinity of the station, and for effecting which a plan and estimate have, I believe, been prepared, will tend to prevent, or, at all events, mitigate the prevalence of epidemic disease, having malarious origin. Any other supposed or probable causes, such as stagnation of the atmosphere and climatic changes, are beyond control.
V. Intemperance.	1. The soldiers at the station are temperate. There are very few confirmed drunkards, and a drunken soldier is seldom seen at Peshawur. 2. The proportion of admissions into hospital from diseases caused directly by intemperance varies. During the past medical year it was 1·113 per cent. to the treated in all the European troops at this station. The proportion of those diseases caused indirectly through intemperance is not known. There are no records available from which a table, showing the effect of abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station, can be prepared. Drunkenness is always punished as an offence. 3. Government rum only is sold in the canteen; but none in the bazaar. The average quantity of good rum consumed by each man per diem is $0\frac{47}{61}\frac{14}{45}$ of a dram. Spirit forms no part of the ration for soldiers. The men cannot obtain a morning dram, as it is contrary to regulation for spirits to be issued before evening parade. Spirit is never given as a ration to convalescents; they have medical comforts at the discretion of the medical officer. No injurious drinks other than intoxicating drinks are sold at the canteen or bazaar. 4. When there is no malt liquor a moderate quantity of spirits is actually necessary to some men. The consumption of spirits certainly cannot be said to be conducive to discipline, for what is conducive is improving, and spirit drinking cannot improve while it may injure a regiment's internal discipline. 5. The sale of spirit at canteens is restricted by regulation. To abolish the sale altogether would not be advisable, for there are doubtless some old soldiers who could not do without it, and were it not procurable at the canteen they would by some means get it elsewhere, and of a far less wholesome quality. If an unfailing supply of malt liquor were available it might be that spirits could be entirely done away with; here the supply of malt liquor is very uncertain. 6. Malt liquor is undoubtedly more wholesome than spirits. 7. Coffee, tea, lemonade, soda water, &c. are considerably used at this station. Malt liquor (or failing that, spirits in moderation) is far better than total abstinence. Tea and coffee give no stamina. 8, 9, 10. It would be better to suppress entirely the sale of spirits, and to permit only beer to be sold in the canteens, if beer could be supplied unfailingly. 11. The canteen regulations are that a man may draw one quart of malt liquor and one dram of rum per diem, or he may have two drams of rum and no malt liquor. The man may take his quart of malt liquor at dinner, or he may divide and take part at dinner and part after evening parade. The bazaar regulations are that the sale of all spirituous liquors is strictly forbidden, and the Abkaree and regimental police are on the look out for offenders. These regulations are strictly acted up to. See section X. Bengal Military Regulations and the Punjab government rules for Abkaree.
VI. Diet.	1. The composition of the ration for Queen's British and European troops in the Indian army is as follows:—Bread, 1 lb.; meat, 1 lb. (beef five times, and mutton twice a week); tea, $\frac{5}{7}$ oz. (or coffee, $1\frac{1}{7}$ oz.); sugar, $2\frac{1}{2}$ oz.; rice, 4 oz.; salt, 1 oz.; vegetables, 1 lb. (potatoes, 8 oz.; mixed vegetables, 8 oz.); and firewood, 3 lb. An inspection of the ration is made daily by the captain and subaltern on duty, frequently by the commanding officer of the regiment, and occasionally by the brigadier commanding the station. 2. There is a complete ration provided for the troops, with a due proportion of vegetables (no fruit). The stoppage for rations per diem is 3 annas 4 pie; and, besides, the infantry regiments in the Peshawur district pay 1 anna per diem, and the artillery about 2 annas per diem, for the purpose of bettering their mess, and this has been found of great advantage. The soldier takes three meals a day, viz., breakfast at 7 a.m., dinner at 1 p.m., and supper at 5 p.m. The proportion of vegetables which enters into the composition of the ration is 1 lb. per man. 3. The rations are excellent at Peshawur. To prevent the troops disposing of their rations there is an orderly to each mess, whose duty is to see the rations of the mess properly used. A soldier discovered making away with his ration would be severely punished. 4. The means and apparatus available for cooking at the station are the ordinary Indian fire-places and copper vessels; the latter are tinned at stated times. The kitchens at Peshawur are only temporary buildings; they are as clean as possible, sufficiently light, and well ventilated. There is abundance of water. The food is boiled, roasted, stewed, fried, &c.; in fact, the men may have it dressed any way they like. The cooking is excellently done, and varied in every possible way. Tea and coffee are properly prepared. When on a march the men generally have coffee half way between the old and new camp. 5. Gardens for cultivation by soldiers must of necessity be close to the barracks, and this was tried at Peshawur, but did not answer. There is here an excellent Government garden, from which vegetables are purchased by the Commissariat for the soldiers.

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References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties.	1. In winter, the soldier's dress at this station consists of cloth tunic and trousers, forage cap or wicker helmet, and boots; in the summer, cotton (khakee) tunic and trousers, wicker helmet, and boots. The ordinary accoutrements. The present dress is admirably adapted to the climate, and every precaution is taken to guard against the alterations from heat to cold. Men on guard here in the winter have their great coats, to which a serge lining is added. The European troops here at Peshawur have, in addition to their ordinary dress, a wadded coat for winter wear.
Duties.	1. It is advisable that the men should be thoroughly drilled in England before being sent out to India. 2. The ordinary routine of a soldier's duties is as follows. Morning and evening parades, guard mountings, roll calls, ordinary fatigue duties, &c. In the hot weather regimental parades last about three quarters of an hour, and are over by sunrise; in the cold weather, from one to two hours' time, varying from 8 to 10 a.m. Brigade drills are of frequent occurrence, and occasionally very long, but the men do not suffer from this. The best part of the day for drills, marches, &c. is, in the hot weather, between daybreak and sunrise; and, in the cold season, after breakfast. The average number of nights which the European troops have in bed during the week is from five to six. The guards furthest from the barracks are the rear-guards, distant about half a mile. There are roll calls at all the customary hours, but should irregularity be suspected there would be check roll calls at uncertain hours. The effect of night guards on health is considerable at some seasons of the year,—spring and autumn chiefly, and also all through the winter; but every possible precaution is taken.
VIII. Instruction and Recreation.	1. The following are the means of recreation and instruction at this station:—1. Ball court (Left European Infantry lines); 2. Skittle grounds; 3. Schools with good schoolmasters; 4. Libraries and reading rooms, well lighted at night. There are no soldiers' gardens. No workshops have been built for the men, but they work at their trades if so disposed. There is a theatre, but no gymnasia; but there should be a gymnasium in each regimental barracks. In the hot weather, men are restricted to barracks from 10 a.m. to 4 p.m. 2. To improve the existing means of recreation and amusement there should be a gymnasium for each regiment, a large reading room separate from barrack rooms, serjeants' mess, and school-room. These should all be separate buildings, instead of, as now, being taken from the barrack accommodation. 3. Soldiers' savings-banks already exist, and are found highly advantageous. 4. There is no shade for trees close to the barracks, and it is too hot in the daytime to take exercise in the verandahs.
IX. Military Prisons.	1. The only cells at Peshawur are those attached to the guard-rooms of regiments, and these are defective in ventilation. An experimental alteration is about to be made in one set of cells.
X. Field Service.	1. No local regulations for field medical service exist which are not included in the General Presidency Regulations. 2. Any suggestions made by the medical officer would, as a general rule, meet with the attention of the commanding officer. 3. There are no regulations existing here which provide for selection of camping grounds general sanitary arrangements, ventilation, &c., in huts, tents, and hospitals. 4. No answer to this query. Could be answered by Inspector General of the Presidency.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1. Plan of hospital, &c. has been transmitted through quartermaster-general of the army. 2. The European infantry hospitals are situated close to their barracks. The artillery hospital is about a quarter of a mile from the nearest part of artillery barracks, and at least half a mile from the horse lines. The hospitals are clear of the bazaars, but close to the officers' houses, separated merely by the breadth of the road. The sites are open, and nothing interferes with free ventilation. The sites are generally well drained, and not exposed to the evil influence of malaria. 3. The supply of water for the hospital is abundant and wholesome. 4. Refuse water and other impurities are removed from hospital, as from barracks, by carts with barrels. 5. The lowest wards of the hospital are raised 2 feet above the ground, but there is no perflation of air underneath the floors. Roof water is conveyed by surface drains into the general drainage of the cantonment. The surface drainage, and materials of which the hospital is constructed, are the same as those of the barracks. The hospitals are supplied with outer open and inner enclosed verandahs, 12 feet broad; they afford good shelter. Along the outer verandah reed chicks are suspended to ward off the heat and glare. The inner verandahs afford excellent accommodation for the sick when required, but it has not been found necessary to use them of late. The hospital consists of one flat. Table of Hospital Accommodation:— Date of construction, 1851 to 1857. Total number of wards, 21 (6 wards for men and 1 for women in each hospital). Total regulation number of beds for each European infantry hospital, 300. There are three hospitals for Europeans in this station.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft.		Ft.	Ft.
21	24	66	24	20*	31,680	1,320	66	2	26	2	4

* This height includes the gable.

N.B.—Observation or admission wards and inner verandahs are not here shown, as they are not occupied unless the number of sick is very great.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	6. The replies to queries regarding barrack ventilation apply equally to hospitals. 7. Thermantidotes are employed for cooling the hospitals. One is allowed for each ward, and even when the atmosphere is such that they do not cool by evaporation, they throw in a current of fresh air which is beneficial. 8. There are fireplaces at each end of the wards. The walls and ceilings of the wards are cleansed and lime-washed once every six months, but if recommended by a board of medical officers as a sanitary measure more frequently. 9. The privies and urinals of the hospitals are the same as those of the barracks; they are not over cesspits, but are daily cleansed, and are not allowed to become offensive. 10. The lavatory arrangements of the hospital, as well as the barracks, are incomplete and insufficient; no permanent washhouses have yet been built. A portion of each of the outer verandahs is enclosed and partitioned off; these are supplied with earthenware basins. 11. Cold baths, when required, are given by means of mussucks (leather bags), or waterpots; appliances for administering hot baths are available in every hospital. 12. The washing and drying of all hospital linen are done by the washermen out of the station 13. The storage is crowded, first, because there are no quarters for medical subordinates, who consequently occupy what would otherwise be used as storerooms; and, secondly, double quantity of bedding is allowed at Peshawur, and no extra provision made for storing it. 14. The bedsteads are the same as those used in the barracks, and so is the bedding, with the exception that a mattress stuffed with chopped hemp is allowed. 15. The hospital kitchens are conveniently situated as regards the wards, but being merely temporary mud buildings without doors or windows, are of course much exposed in storms and rainy weather. An ample stock of kitchen utensils is provided by the Commissariat Department, and the mode of cooking is varied, as directed by the medical officer. 16. Copies of diet tables, diet rolls, &c., forwarded by Surgeon N. H. Stewart, H.M.'s 98th, along with copy of report transmitted through quartermaster-general of the army. 17. The hospital servants are natives; there is a hospital serjeant in each regiment, and if a man's case requires it, an orderly is told off to attend on him. 18. With the exception of the scanty accommodation for ablution purposes, the sanitary condition of the hospitals is good. No hospital gangrene or pyæmia have appeared in the wards. 19. It is suggested by Dr. N. Stewart, 98th regiment, that in future barracks and hospitals should be built on open arches elevated at least 6 ft. above the ground; this, however, appears hardly necessary at Peshawur, where the foundations are well raised, and the buildings show no sign of dampness. 20. Convalescents are either carried out in doolies, or else ride on elephants. 21. A ward in a separate building from those occupied by the men is appropriated for the use of soldiers' wives and children. A matron and native female servants are employed to attend them. The arrangements are very satisfactory. 22. There are no special local hospital regulations in force at this station, not in the General Presidency Medical Regulations. 23. Repairs affecting the sanitary state and general comfort of the sick in the hospital are executed by the executive engineer upon the requisition of the medical officer, who has also ample powers with reference to the change of diet, and the issue of any medical comforts that may be required for the treatment of the sick in his hospital, at stations, camps, and on the march. 24. There are no wards or hospitals for convalescents, nor are such required.
XIII. Burial of the Dead.	1. There are two graveyards half a mile distant from barracks; one is to the west front, the other to the north-west front of the station. There are no prevailing winds at Peshawur. 2. No answer to this question. 3. Hindoos and Sikhs burn their dead; Mahomedans bury, but their graveyards are out of the station limits. 4. The graveyards have never been offensive. 5. The bodies of camp-followers and bazaar people are disposed of according to caste. 6, 7. No injury accrues to public health from the present practices, nor are there any improvements to be suggested.

(Signed) T. J. Galloway, Brigadier, Commanding Peshawur District.
A. Wilson, Deputy Inspector General of Hospitals.
Charles Pollard, Captain, Bengal Engineers.

16th August 1860.

JULLUNDUR.

Accommodation - European Troops - Artillery - 100 horse; 100 foot.
Infantry - 1,000 men.
Native Troops - Cavalry - 1,000 irregular.
Infantry - 2,000 men.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country round the station is flat and sandy, with very little jungle, wood, or water in the vicinity. 2. It is elevated 937 feet above the sea level, and is slightly higher (1 to 12 feet) than the surrounding country. 3. There are a few large excavations within the boundary of the station, in which water lies, none of which are offensive. There is a jheel on the S.E. boundary of considerable size, which receives about a third part of the drainage of the station. There is no higher or better ground near the station.

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References to Subjects and Queries.	Replies.
I. Topography—*cont.*	3. The nearest mountains are 28 miles north; a broken ridge extending for 70 miles northwards, and varying from 2,000 to 5,000 feet in elevation above the sea level. 4. The nearest water to the station is the Bain Nullah, which runs within five miles on the south-east. The ground being level, is liable to temporary slight overflows, which subside within 24 hours, owing to the sandy nature of the soil. There are no ravines or broken ground near the station, except the excavations above referred to. 5. The station is open and freely exposed. The temperature of the station is not raised by the buildings being exposed to reflected sun heat. The station is open to all the winds that blow, and their effect upon health is good. 6. The surrounding country is generally cultivated. The crops are watered from wells all round the station, also the gardens in the station. No effect is observed from artificial irrigation on the health of the station. Rice is not cultivated. Neither are hemp, flax, or indigo cultivated near the station. 7. The city of Jullundur is three miles from the cantonments. 8. No reply. 9. Water is usually found during the dry season at 17 feet below the surface, and during the rainy season at 16 feet. 10. The rain fall generally sinks into the soil. There is no adjacent higher ground the drainage from which can pass through the station. 11. The water supply is derived from wells. No tanks are used for drinking purposes. Tanks are full or nearly dry according to the season and the quantity of rain that falls. "Singarahs," a sort of vegetable much used by the natives, are grown on some of the tanks. No tank used for drinking purposes is also used for bathing. There are no trees near the tanks, but the bazaar is drained into some of them. Malaria and foul smells proceed from the tanks; the best means of preventing such nuisance is to have the large one deepened and the small ones filled up. 12. The amount of water supply is plentiful, and of a good wholesome description. No better supply is obtainable. 13. No reply. 14. New stations are selected by committees appointed by Government. There is no copy of any special regulations on the subject.
II. Climate.	1. There is a thermometer in each hospital. 2. There are no data for preparing a meteorological table. 3. The climate is good, with only three months of rainy season, July, August, and September; the other months are generally dry, with occasional dust and thunderstorms. A change of clothing is required about the beginning of October, when the nights become cold. September and October are generally the most unhealthy months, and the prevailing disease is intermittent fever. 4. I do not know any station in India more conducive to health than this; I have always considered it the most healthy. 5. I served at Meerut for a short time in 1842–43; Umballa, in 1843–44; Loodiana, 1844; Shikapore, Sinde, in 1844–45–46; Muttra, 1846; Phillour, 1847; Lahore, 1847; Mooltan, 1847–48; Loodiana, 1848–49; Kurnool, 1849; Hissar, 1850 to 1855; and Jullundur, from January 1857 to the present time. From the short period I have been located at most of the above stations, I am unable to offer an opinion as to their comparative salubrity. Hissar is not conducive to the health of either European or native.
III. Sanitary Condition of Station.	1, 2, 3, maps and plans. 4. The following table gives the accommodation:— Date and construction of barracks:—E. I. Lines, Nos. 1 to 10 in 1848, No. 11 in 1850, and No. 12 in 1855–56; Foot Artillery Barracks, in 1850–51; Horse do., 1848; Horse do., married, 1851; Foot do., married, 1856–57–58.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
			Ft.	Ft.				Ft. In.			
Nos. 1 to 10 Barrack, all alike, containing four rooms each.	16	45	24	23	25,760	1,610	45	1 8			
4 verandah rooms -	4	32	12	17	6,528	1,632	96	1 8			
4 do. do. -	3	21	12	17	4,284	1,426	84	1 8			
No. 11, Married Barrack, 16 rooms -	1 family	24	10	23	5,520	5,520 per family.	240 per family.	1 8			
No. 12, Married Barrack, 40 rooms -	1 family to two rooms	16 13	13 13	193	4,004 3,211	7 215 per family.	377 per family.	1 8	2	4	4
Foot Artillery Barrack, three rooms.	22	69½	24	30	50,040	2,274	75½	1 8	6	2	4
Ditto eight rooms	3	22	12	21	5,514	1,838	68	1 8	1	2	4
Horse Artillery Barrack, three rooms.	24	67	24	20½	32,964	1,373	62	1 8			
Ditto eight rooms	3	21	12	18	4,536	1,512	84	1 8			
Ditto, Married Barrack, 24 rooms - - -	two per family	12 10	10 10	14 10	3,680	3,680 per family.	220 per family.	1 8			
Foot Artillery, Married Barrack, 18 rooms -	two per family	16 12	13 13	20	5,880	5,880	364 per family.	1 8	2	4	2

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows of the barracks are on opposite sides, revolving on their centres, and are opened by ropes from below. Verandahs are built round all barracks, and are generally 10 feet wide. There are no jalousies or jhilmils. 6. The bedsteads are of wood, with rough coir bottoms. The bedding consists of a mattrass, blankets, sheets, and cotton resai. No cots or mattrasses are used in camp. I can suggest no improvement. 7. No reply. 8. The means of ventilation in barracks and guard-rooms are by air openings along the ridge. The ventilation is sufficient to keep the air pure by night as well as by day. Punkahs and tatties are used for cooling the air. 9. Barracks and other public buildings are constructed of Pucka and Kutcha bricks, laid on lime or mud cement; the roof generally thatched, and, in some cases, tiles over thatch, and in a few instances Pucka tiled roofs. 10. Floors are generally of brick or flat tiles laid over a bed of concrete, and raised from 1 to 2 feet above the level of the ground. There are no passages for air beneath the floor. 11. The barracks for Europeans are chiefly built of Pucka brick with thatched roofs, and are of a good description, but at present considerably out of repair. The tents are of strong cotton cloth. I have no improvements to suggest. The barracks and cantonments are kept in repair by the executive engineer of the station, on requisition of the commanding officers through the barrack masters. The repairs are quickly executed. The walls and ceilings of barracks are cleansed and limewashed annually, and at any other time, on emergent requisition of the commanding and medical officer. 12. I have attached a sketch showing the lavatory for one company of 100 men. The water is kept in ghurrees or tubs. No baths for troops exist on the station. 13. Water for cooking is supplied from a well. Refuse water is drained into a cesspool, whence it is carried away by carts. The linen is washed by dhobies, and dried in the sun. 14. A sketch of the urinals is attached to the wash-house plan. Sketch of the privies is also attached. They are drained into cesspools; solid filth is carried away in carts. 15. The buildings are lighted by windows, and ventilated by openings in the roof and by windows. 16. There are open drains throughout the station kutcha; there are no station sewers, and drainage is only for rain water. The drainage for surface water is sufficient to carry away 6 inches in 24 hours, and owing to the sandy soil no inconvenience is felt from excess of moisture. The barracks and hospitals are perfectly dry. The refuse from cook-houses is carted away, and the liquid refuse from privies, urinals, and wash-houses is received into cesspools. The cesspools are underground, and connected by short underground drains with the wash-houses which they drain. They are 8 inches in diameter and 14 deep, and never within 60 yards of any well. The wash-house cesspools are about 50 feet from the barracks, but covered over, and no smell is perceptible. They are cleansed whenever required on requisition from the commanding officer. There are no foul ditches near the station. 17. The conservancy of the station is in charge of the barrack master, who has an establishment of carts and sweepers, who constantly perambulate the station, and remove all filth to the outside of the cantonment boundary pillars. 18. The surface of the cantonment is kept free from vegetation. There are some old buildings and walls in the European infantry bazaar, which could be advantageously removed, the bazaar being much too large for the requirements of one regiment. 19. The bazaars are clean and generally well drained, with free circulation of air, and are not overcrowded. Privies are erected for the natives. No native houses are near the station, except in the bazaars, nor is any nuisance experienced from the wind blowing over the native dwellings. 20. The slaughter-houses are in the bazaar; they are well regulated, kept clean, and the offal removed daily outside the precincts of the cantonment. No nuisance is experienced from them. 21. The horses belonging to the bazaar and camp followers are kept in a space set apart for them in the sudder bazaar. Some keep their horses in private stables; sweepers are hired for keeping these places clean, and the manure is carried away on donkeys every day, and sold to the villagers outside the cantonments. Any one allowing filth to accumulate is fined and compelled to remove it. 22. The cavalry and artillery horses are picketed; there are no stalls, except for sick horses, and the manure is disposed of by allowing potters to carry it away, or it is conveyed beyond cantonment boundary on the requisition of the commanding officer. In the irregular cavalry each man's horse is close to his hut. In the artillery lines the barracks of the men are 600 feet distant from their horses, and the hospital is distant 2,000 feet. 23. There are sufficient quarters for married non-commissioned officers and men at present, but this depends entirely on the number of women with the regiment. I know no case where the women occupy barracks in common with the men.
Officers' Quarters.	1. Officers occupy separate houses in their own enclosures, of every size, height, and plan. All of them are private property.
IV. Health of the Troops.	1. The station and adjoining population are most healthy. 2. The prevalent diseases are intermittent fevers and dysentery. No epidemics prevail, and spleen is by no means common. 3. I attribute the healthiness of the station to the small quantity of rain which falls at regular intervals in the early part of the season. Where there is unhealthiness it generally has happened that the rains were heavy and late in the season. 4. The 46th Regiment was stationed for 10 months at Mooltan and left it in January 1860. Their health there during the hot season was indifferent, and they suffered from fever, sunstroke, and scorbutic sores. They arrived at Jullundur in February 1860 in good health, but still suffering from the Mooltan sores. No particular disease has been prevalent since they arrived at Jullundur.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	The 4th Company Artillery arrived at Jullundur 1st April 1859 from Lahore, where they had been stationed three months. They were in good health. The site of the artillery barracks being much higher than that of the infantry, the former are more healthily situated. From the same cause the right wing of the infantry barracks is healthier than the left. The ground surrounding the latter is flooded after a moderate fall of rain, and from the drainage being imperfect, remains so till absorbed. 5. There is no general rule for troops being camped out, but the effect it had was good when in 1858 the cholera broke out in Her Majesty's 87th Fusilier hospital. 6, 7. I have never been in charge of troops at hill stations, and have had no opportunity of observing the effects produced by them. 8. I disapprove generally of selecting hill stations for troops. 9. Diarrhœa, dysentery, and rheumatism are diseases to which troops are liable in hill stations. 10. Diarrhœa and dysentery are generally attributed to the water in hill stations, and I am not aware of any precaution likely to guard the men from attacks. 11. The hot season and after the rains till the end of November are the best seasons adapted for residence in hill stations, and in most cases a residence of six months would enable troops to obtain the full benefit of it. 12. I am unable to judge beyond what period injury to health is likely to be inflicted by residence at hill stations on the return of troops to the plains. 13. The chief precautions for protecting the health of troops on their return from hill stations to the plains, are to guard against exposure to the sun and over-indulgence in spirituous liquors. 14. I would keep the hill stations merely as convalescent depôts, and medical officers in charge of troops ought to be able to send men at any time to the hills for whom they might deem such a change necessary. If a station is unhealthy, a change each year would be beneficial. 15, 16. I do not know whether the barrack and hospital accommodation provided at hill stations is sufficient; nor do I know at what ranges of elevation the most suitable sites may be obtained. 17. There is no high ground suitable for a hill station within 120 miles of this station. Dalhousie, 120 miles distant, is 8,000 feet above the sea, and the climate is excellent. 18. I have not found any particular classes of surface and subsoil more healthy or unhealthy than others. 19. The best age for soldiers proceeding to India is between 18 and 25, and the beginning of November is the best time for troops to land. I have no experience as to the manner in which troops are disposed of on landing. They should guard against exposure to the sun, sleeping in the open air, and the use of ardent spirits. 20. Troops should be sent direct to India from home. I have no faith in acclimatizing. Strict supervision within and out-door amusements are the best safeguards. 21. I do not know what is the mode of transport from the port to the interior. 22. I consider that about 10 years is sufficient for a British soldier to serve in India. 23. The manner of conducting the business of medical boards is good. 24. Invalids should leave India about the end of February.
Diseases.	1. Inspection for the discovery of incipient disease in this station are made once a week, and oftener if required. 2. There have been some few cases of scurvy among the troops at the station this season, but I am unable to state the proportion to other diseases, the regiment (Her Majesty's 87th) in which they occurred having left for China. I attribute these cases to the want of potatoes as an article of diet during a portion of the year, and I would suggest a regular supply of vegetables, particularly potatoes, as the best preventive. 3. I am unable to state the proportion of hepatic diseases under treatment, not having sufficient data to go on, there being only 100 European troops at the station who have been here during a hot and rainy season. Her Majesty's 46th Regiment arrived only last month from Mooltan. 4. There has not been a case of dracunculas among the Europeans at the station since I have been in charge. 5. During the last year 16 per cent. of the Europeans and about 7½ of the native troops have been constantly sick from venereal disease. I would suggest regular inspection of the prostitutes by a competent female, and registration of all such persons in each bazaar, and also that a heavy fine be inflicted on any person concealing the disease. Lock hospitals would be most advantageous. 6. The troops at the station suffer from diseases of the endemic class; fevers of the intermittent type, and dysentery. Cholera has only once visited the cantonment (in 1858), and that in a very limited degree, being confined to the sick in the infantry hospital. It was, however, prevalent all over the district during the same year, and also during the year 1857. Of small-pox I have never seen a case among the Europeans at the station, and rheumatism is by no means common. Since the 1st of April 1859, the date on which the 4th Company, 3rd Battalion, Foot Artillery arrived at the station, there have only been 26 admissions for fever, 6 for dysentery, and 7 of rheumatism, out of a total of 176 admissions into hospital. 7. Zymotic diseases are most prevalent after the rains till November. The climatic peculiarities attending them are a hot sun by day with cold damp nights. In general the sanitary arrangements of the bazaar are good, and nothing in the cantonments show cause for the prevalence of these diseases, unless in one or two places, where the drainage may be deficient from the nature of the ground. The bazaars are not overcrowded, and there is a free circulation of air through the entire station. There are no peculiar habits or condition of the troops which appear to predispose to these diseases. 8. There are no duties which the soldier has to perform likely in any way to cause epidemic disease, either on the march or in cantonment. 9. Quinine has not been tried by me or any other medical man on the station as a prophylactic against malarious diseases. 10. In former reports I have brought to the notice of the authorities the existence of large excavations in the centre of the station, but without any effect. Of these there are three

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	close together, and in my opinion much benefit would accrue to the health of the community were one of these deepened, and with what would be taken out of it, the others might be filled up at a trifling cost. At present the banks are in a very irregular state, and there is a large malarial surface.
V. Intemperance.	1. The soldiers at the station are temperate; we have no confirmed drunkards. 2. There are no statistics to go on as to the proportion of disease, directly or indirectly caused by intemperance. Drunkenness is always punished as an offence. 3. Distilled spirits are sold both at the canteen and the bazaar. The quality is good, and the quantity consumed varies, but is always less than a dram for each man per diem. Spirit is no part of the soldier's ration, but he can obtain it in the canteen at the station, or from the commissariat in the field or on march, by paying for it. The quality is good, and the amount is never allowed to exceed two drams per diem. The men are not allowed to take a dram before morning parade. Rum or brandy are given to convalescents only when thought necessary. No drinks injurious to health are sold at the canteen or bazaar. 4. The consumption of spirits by troops and convalescents is injurious to health, nor is it conducive to discipline. 5. It would be beneficial to the health of the troops to abolish or restrict the sale of spirituous liquors in the canteens and bazaars. 6. Malt liquors would have a beneficial effect on the health of the troops. 7. Coffee, tea, lemonade, soda water, and similar drinks are not much used at the station. I am of opinion that spirit rations ought to be suppressed entirely, and malt liquors and coffee substituted. 8. It would be beneficial both for soldiers and convalescents to do so. 9. It would be beneficial to permit only beer, coffee, tea, lemonade, &c., to be sold in the canteens to the troops. 10. I would recommend that coffee be issued to the troops each morning before leaving for parade, and that beer should be allowed at dinner, and also at night, which latter allowance ought to be drank at the canteen to ensure that no man gets more than his proper allowance. 11. No reply.
VI. Diet.	1. The ration for Queen's British troops, and for European troops in the Indian army, consists of 1 lb. of bread, 1 lb. of meat (mutton twice a week), 4 oz. of rice, 2½ oz. sugar, ⅔ of an oz. of tea, or ⅓ of coffee, 1 oz. salt, ¾ lb. of potatoes, ¼ lb. mixed vegetables. The rations are inspected daily by the quartermaster and the orderly officer: frequently by the commanding officer. 2. A complete ration, with the proportion of vegetables mentioned above, is issued daily. A soldier has three meals a day: dinner at 1 p.m., breakfast at 8 a.m., and tea at 4, 5, or 6 p.m., according to the season. The stoppage for the ration is 3 annas and 4 pice the day. 3. An improved ration would be conducive to the health of the troops. A man is stationed in each cookhouse to prevent any part of the rations being disposed of. 4. The apparatus for cooking consists of 1 copper camp kettle, 1 copper tea kettle, 1 camp kettle lid, and 1 baking dish for every ten men. There is a cookhouse for each company. The cookhouses are good, and there is a well to each. The food is boiled or roasted at the option of the men. The cooking is good and sufficiently varied. The men have coffee before a march, and half way. 5. I do not think gardens could be advantageously established; soldiers do not like gardening.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of a cloth tunic, cloth trousers, and forage cap in the cold season; khakee jacket and trousers, with bamboo frame-work helmet in the hot season. I consider the present dress suitable to the climate, and have no improvement to suggest. On guard the men wear khakee during the hot, and cloth during the cold season. They have also a cloth great coat, which is worn when required. Sentries are protected from the sun and rain by verandahs and sentry boxes.
Duties.	1. It would be advisable that all soldiers should be drilled thoroughly in England previous to landing in India. 2. The soldier attends all drills and parades, takes his turn of guard and fatigues, keeps his arms and accoutrements in good order, and looks after the cleanliness and order of his barrack room. During the hot season there is one drill on parade a week, immediately after daybreak. In the cold season, one parade in the morning, the other in the evening. The European troops at Jullundur have at present 20 nights consecutively in bed. 3. All guards are within three-quarters of a mile of the barracks, and are mounted for 24 hours. There is one roll call at tattoo, and two during the day if there are no parades. The men do not suffer in health from night duty.
VIII. Instruction and Recreation.	1. There is a ball court, four-sided, in the European infantry lines, and a single ball court in the artillery lines. There are two skittle alleys in the infantry lines, and one in the artillery. There is a regimental school. A library and reading room, sufficiently lighted at night. Two gardens, one out of order, and not used by the 46th Regiment, the other used by the artillery. There are no workshops. There is one private theatre, not at present in use. No gymnasia. None of the above except the reading room could be used during the heat of the day. No man is allowed to go out during the heat of the day, and the result is favourable to health. 2. I would suggest as an improvement the formation of a skittle ground, and more skittle alleys, and ball courts. 3. Savings' banks have been instituted, and are decidedly advantageous. 4. There is no sufficient shade, and no amount of shade would enable soldiers to take exercise in the heat of the day during the hot season without injury to health.
IX. Military Prisons.	1. The cells are in good condition, not overcrowded, and are well-ventilated.
X. Field Service.	1. I am not aware of any local regulations for field service, not included in the general Presidency regulations. 2. From my experience the present system, as regards the power of the medical officer in the conduct of the line of march, bivouacking, camping, billeting, &c., appears to work well. 3 and 4. No replies.

JULLUNDUR. BENGAL.

References to Subjects and Queries.	REPLIES.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No replies.
XII. HOSPITALS.	1. I have sent a ground plan of the hospital, with a copy of these questions, to Government. 2. The European infantry hospital is dismantled, and No. 1 barrack is used as a temporary hospital. The Artillery hospital is 900 feet from the nearest barrack, and 2,000 feet from the stables. It is 750 feet from the bazaar and 300 feet from the nearest private bungalow. The site is open and very healthy. 3. The water supply is abundant and wholesome. 4. No means of drainage. Solid filth is carted away. 5. The wards are 3 feet above the ground, and there is no ventilation beneath the floors. The roof water sinks into the soil, but not within 10 feet of the hospital verandah, as there is a metal slope round the outside 10 feet wide. The drainage is effected by shallow open drains, which would hardly be sufficient for the purpose but for the sandy nature of the soil, which prevents any water lying more than a few hours on the surface. The hospital has mud walls, 2½ feet thick, enclosed verandahs and outer verandahs. Thatch, 9 inches thick. Verandahs all round, 10 feet wide. The verandahs are never used for sick. The following table gives the ward accommodation:—

Artillery Division Hospital.

Date of Construction, 1847–48.

Total No. of Wards, 3. Total Regulation No. of Beds, 58.

Wards.	Regulation Number of Men in each Ward.	Dimensions of Wards.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		Ft.	Ft.	Ft.				Ft. In.			
2 -	24	72	24	24	41,472	1,728	72	1 8			
1 -	10	24	24	24	9,024	902	57	1 8			

N.B.—The European Infantry hospital is dismantled, and Nos. 1 and 2 Barracks are used as a temporary hospital. *See* Measurement of Barracks.

Cubic contents do not include the portion of roof above wall plates, nor verandah.

The hospital is so placed as to receive the full benefit of the prevailing winds.

There are no windows, only ridge ventilation.

6. The hospital is well ventilated. There are no jalousies or jhilmils.
7. The air is cooled by means of punkahs and tatties.
8. There are no means of warming.

The walls and ceilings are cleansed and limewashed annually, and as often as the medical officer requires.

9. A sketch of the privies is sent with the Government copy.

They are well drained, and seldom offensive.

10. Large basins are fixed in masonry with gurrahs for douche baths, and tubs for warm baths.
11. The means of bathing for the sick are by douche and hip baths.
12. The washing is done by a dhobie.
13. The storage is dry and sufficient.
14. The bedsteads are a wooden frame, with grass-rope bottoms, easily cleaned and repaired. The bedding is good and suited for the seasons.
15. The kitchen is a Pucka building, situated on the east side of the hospital, and about 60 feet from it. The diets are cooked in copper vessels, which are considered sufficient. The cooking is generally good, and can be sufficiently varied at the will of the medical officer.
16. The "Bengal Medical Regulations" include all forms used in hospital.
17. In the principal European hospitals there is a hospital serjeant, one apothecary, whose duty it is to see that the wants of the sick are attended to in the absence of the surgeon. There is also a hospital steward, who regulates the dieting of the sick, and other subordinates to attend to their wants; and in the case of a man being very ill, his comrade is generally selected from the ranks to attend him. The amount of attendance is sufficient.
18. The hospital is most healthy, and to my knowledge no epidemic or hospital gangrene has ever appeared within it.
19. There are no deficiencies or sanitary defects, or improvements to be suggested.
20. There is not any provision made for convalescents taking exercise further than taking a walk in the hospital compound, which is an open plot of ground, surrounded by a mud wall about 6 feet high. There are no trees in the enclosure.
21. A ward is allotted for women and children in all hospitals, and an ayah is kept to attend on them when required. A permanent ayah ought always to be allowed on a European hospital establishment, no matter how few the strength, as long as there are women belonging to the detachment.
22. There are no special local hospital regulations.
23. The medical officer has full power in all sanitary arrangements; also as regards repair of hospitals, diet, and medical comforts, subject always to confirmation, which is invariably given when cause is shown for the necessity.
24. There are no convalescent wards or hospital for convalescents, nor do I consider such necessary at this station.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1. There is a burial ground 2,750 feet from the nearest building, and it is situated on the western boundary of the station. Its size is 200 feet by 200 feet. A second burial ground for the infantry is 2,100 feet from the nearest barrack, and is at the south-west boundary of the station. It is 300 by 450 feet. 3. No grave is allowed to occupy more than 10 feet by 7, and the interval between the graves is 3 feet. No grave is of less depth than 5 feet, and is not permitted to be reopened for the interment of a second body in the same grave. In the hot weather, if an individual dies before 2 P.M., the funeral takes place that evening about sunset. If death takes place after 2 P.M., the funeral is at sunrise. Native Christians are buried in the station or Artillery burial ground. 4. The grave yard is never offensive. 5. Camp followers and bazaar people, if Mahomedans, are buried near a village about half a mile from the Artillery lines. If Hindoos, they are taken to the river, about four miles distant, and the bodies burned, and the ashes thrown into the river. 6. No injury accrues to health from the present practice. 7. I would recommend that a hearse should be provided for the use of the station.

(Signed) C. A. Campbell, Lieut.-Colonel, 46th Regiment, commanding at Jullundur.
C. W. Nightingale, Executive Engineer, Jullundur.
S. A. Homan, Surgeon, 3rd Battalion Artillery, Senior Medical Officer.

Jullundur, 19th May 1860.

RAWUL PINDI.

Accommodation:
- European Troops
  - Artillery — 4th Troop, 2nd Brigade B.H.A.; 4th Co. 2nd Batt. B.F.A.
  - Infantry — H.M. 81st and 93rd Regiments.
- Native Troops
  - Cavalry — 18th I.C.
  - Infantry — 21st N.I.

References to Subjects and Queries.	Replies.
I. Topography.	1. The cantonment is bounded on the north by a fine alluvial plain, running to the foot of a considerable range of mountains at 15 miles distance, the height of which is from 2,000 to 3,000 feet; on the east by low hills and undulating ground, and on the south and west by arable land, occasionally broken by deep ravines. The barracks and public buildings are generally placed on the water-shed of a high strip of ground, and are well drained to the south into a ravine, and to the north into the Leh nullah. There is not much wood jungle or water in the vicinity. 2. The approximate height of Rawul Pindi cantonment above the level of the sea is 1,500 feet, the adjacent country being a few feet lower. The nearest running stream, the Leh, being about 70 feet below the level of the old, and 100 feet below the level of the new barracks. There is no adjacent higher ground which would have suited better for a station. 3. The nearest mountains are those already mentioned, about 15 miles in a direct line from the station. These are unfitted for the location of troops; but at a distance of 39 miles, by an excellent road lately constructed, is the Sanitarium of Murree, with accommodation for 300 invalids, of whom 36 may be married. The Murree Hill is nearly 6,000 feet above the station and 7,200 above the sea. 4. The Leh nullah bounds the station on the north. The Sohan, a larger stream (both mountain torrents), is 4 miles distant. The banks of the Leh are high, and though the torrent swells greatly in heavy rain it never floods the cantonment, but occasionally does the low lands towards the city. There is a great deal of broken ground and many ravines to the south of the station, but no stagnant water, as all drains into the nullahs and eventually into the Sohan. 5. The station is open and freely exposed to winds. There are no trees, hedges, &c., to interfere with the ventilation. The radiation of heat from the buildings in the station, which are anything but crowded, does not tend to increase the temperature. The winds that prevail are wholesome dry winds, not damp nor unhealthy, and as a rule are steady from N.W. or S.E. They are mostly from N.W.; the S.E. winds indicate rain. 6. The surrounding country, where the ground is tolerably level, is well cultivated;—that portion towards the hills being particularly fertile. There is no irrigation, or but very little. It is not much required, as, from the vicinity of the station to the hills a fair amount of rain falls, particularly in the cold season. The irrigation has no effect on health. No rice, indigo, or flax is grown in the vicinity. 7. The city of Rawul Pindi is about a mile from the north boundary of the station, and is the only town near it. There are three villages, viz., Adrah, Ruttah, and Murreer, immediately on the outskirts of the cantonment. 8. The geological structure of the district is as follows:—A base of conglomerate of limestone boulders, occasionally varied with veins of sandstone which crop out in several places, superlaid with pure red clay, over which is a stratum of fine loam. Most part of the station occupies new ground, though there were one or two villages which were moved for space, and a few graves near the outskirts indicate the prior occupation of a portion of it. 9. Water is found at a depth of from 70 to 100 feet, according to the elevation of the wells, and differs but little during the rainy or dry season.

RAWUL PINDI. BENGAL.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	10. The natural drainage is so fine that rain water never lodges in the station. It does not, as a rule, penetrate far, but flows off to the natural drains over the surface, without percolating through. There is no adjacent high ground, the drainage from which can pass into the subsoil of the station. 11. The water supply is derived from wells. The river water is very good, and is useful for watering cattle. It is not stored in open tanks. The wells are not liable to pollution from impurities passing into them. 12. The water supply is ample, both from wells and from the Leh nullah; but the wells being deep it is troublesome to raise in large quantities. Bullocks are used for this purpose. The water, as a rule, is very clear, tasteless, and without smell. It is "hard," and not injurious to health. The quantity of well water is sufficient for the station. It is raised and distributed by bheesties and bullocks. No better water is to be obtained. 13. I have no other topographical points to state. 14. Stations are generally chosen in the following manner:—The political necessity is in the first instance determined by Government for placing a certain force in or near a certain town or locality, after which a committee composed of two military, two medical officers, and an engineer, are usually deputed to select an eligible and healthy spot. Provided the members of the committee are all men of known experience, not any improvements could be made in this procedure.
II. CLIMATE.	1. In the artillery division we have only thermometers. Every station should have a set of instruments for meteorological observations. 2. I am unable to furnish a meteorological table. 3. The climate of Rawul Pindi has been proved by 10 years' experience to be decidedly the finest in the plains of India. The station is situated on high ground, with fine natural drainage, and with good roads, which are much required, it would be as perfect as it is to be expected any tropical climate can be. For seven months in the year ordinary winter clothing is necessary, accompanied with a generous diet. During the remaining five, the lighter the clothing and the less stimulating the food the better. A liberal supply of vegetable food is most desirable during the hot weather. During the cold season the drills, &c. could be carried on in the daytime, but in the warm season must be in the early morning. According to the admissions into the artillery hospital during the year ending 31st March 1860, the months of May, June, July, and August are the most unhealthy; December, January, February, and March the most healthy. The principal diseases during the unhealthy months are generally fever and diarrhœa. 4. I know no district near the station the climate of which is more healthy.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Maps and plans sent with another report. 4. The following table shows the barrack accommodation:—

ARTILLERY BARRACKS.

Date of construction, from October 1858 to July 1859.

Total number of rooms, 8.

Total regulation number of non-commissioned officers and men, 200.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
				Under roof framing.							
8	24	66	24	24	38,016	1,584	66	2	6 6	2½ 2½	4 6
Non-commissioned Officers' Room.	1	14	13	24	4,368	4,368	182	2	2½	2½	6
Guard Room	16	41	18	16	11,808	738	46	2	6	21	4

No prison cells are ready.

5. The barracks have door panel windows, ventilating and dormer. Both open on pivots. The windows are on opposite sides. The doors double, and open on hinges. There are outer and inner verandahs on both sides of the entire length, outer, only, at the ends. The inner, 12 feet wide, outer 10 feet wide. The inner verandah is not used as a sleeping apartment, but merely to mess in. There are no jalousies or jhilmils.

6. The bedsteads are of wood, 7 × 3¼ feet, with cotton tape bottoms. I should recommend iron as less likely to harbour vermin, more durable, and neater in appearance.

7. Tents (privates') are made of country canvass, and consist of kanats and double roofs. Their dimensions are 20 feet × 16 ditto. 25 men are allowed to each tent. The occupants have about 100 cubic feet of air each; when the tents are shut up, as they have to be in cold weather or during rain, they become overcrowded. Tents for serjeants are made of similar materials, and in their shape resemble the hill tents of officers.

8. There is both ridge and dormer-window ventilation, and ridge and side lights in the barracks. Tents are ventilated by means of the doors, 4 in each privates' tent, and 2 in the staff serjeant's. The ventilation is quite sufficent to keep the air pure, as well by night as by day. Tatties and punkahs are used for cooling the air in the hot season.

9. Barracks are constructed of good kiln-burnt bricks, cemented with mortar. Tents are made of the strong country canvass. Huts are generally made of mud.

10. The floors are not yet laid down in the artillery barracks, but will be of brick placed on edge. The floors are well raised above the level of the ground, and are particularly dry. There is no ventilation beneath.

11. The materials of which the barracks are constructed are the most suitable the country affords. Barracks are kept in repair by the executive engineer, and the repairs are always executed at once on the requisition of the barrack master or of the regimental authorities.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	The barracks are whitewashed once a year, but oftener if deemed necessary by the medical officer. 12, 13. Sketch of lavatories and cookhouses forwarded but not received. Linen is washed in the Leh nullah by the dhobies. The nullah is conveniently situated, and is sufficient for the wants of the station. 14. The contents of the privies are carted away and buried outside the cantonment daily. 15. The barracks and privies are lighted at night by oil lamps. All the out-offices have ridge ventilation. 16. There are no sewers, all sewerage being collected in masonry cesspools and removed daily. The drains for carrying off the rain water are merely trenches, and are quite sufficient for carrying it away, without allowing any water to become stagnant in the barracks or their neighbourhood. The drains for carrying off rain water are open and well arranged. The water from the men's lavatories runs into a masonry cesspool, also the water from the cook-rooms, and is emptied daily and carried away by the conservancy carts. The filth from the privies is also carried away daily in the conservancy carts. None of the buildings are damp, and the drainage is sufficient. There are no foul ditches. 17. The surface cleansing about the barracks is done daily by sweepers, and the refuse taken away in the conservancy carts. 18. The surface of the cantonment is kept free from vegetation. When any excessive vegetation springs up it is removed by the executive engineer. Officers have to keep down vegetation in their own compounds. There are no old walls, hedges, &c. to interfere with the ventilation. 19. This being comparatively a new station the bazaars are not crowded. The sudder bazaar is well laid out, with broad thoroughfares that allow of free ventilation. It has masonry drains in nearly all the streets, and these are kept clean and free from garbage, &c. by a good staff of sweepers. Latrines are some distance from the bazaar. The bazaar is under the control of the cantonment magistrate, who enforces cleanliness, &c. There are no native houses near the station, and no dung pits or cesspits. No nuisance is experienced from winds blowing over native dwellings. 20. No nuisance is experienced from the slaughter-house, which is in the cantonment, though at a considerable distance from the barracks. Such offal as is not sold for dog's-meat is buried. 21. The manure of the Government stables is burnt by the executive engineer in his brick kilns. These stables are about 1,000 feet from the artillery barracks. There are no other horses picketed on the cantonment, and but few animals in the sudder bazaar. The grass cutter's ponies are kept in their lines, which are behind the artillery horses, and at a greater distance from the barracks. The officers on troop and battery duty are responsible that the lines are kept perfectly clean. 22. There are no cavalry or artillery stables. All the horses are picketed in the open air, and are about 1,000 feet distant from the barrack, and out of the direction of the prevailing winds. The horse lines are kept very clean; the litter, &c., being carted away by the executive engineer to be burnt in the brick kilns. Picketing ground for artillery horses is arranged in three divisions to the west of the barracks, and 1,000 feet distant from them. The horses of the H. Artillery and Light Field Battery are separate, and are arranged similarly with respect to distance, &c., from the respective barracks. The horses are about 1,000 yards distant from the hospital. 23. There are as yet no quarters for married people built specially for the artillery; they do not occupy barrack rooms with the men.
Officers' Quarters.	1. The officers live in private bungalows, which are found to be healthy.
IV. Health of the Troops.	1. The station, the district, and the adjoining native population are generally healthy. 2. Almost every year there is an epidemic of variola amongst the native population, generally at the commencement of the hot season. Rubeola is also common; calculous affections are very commonly met with, particularly those natives who live near and on the hills. I am not aware that the natives in this district suffer from spleen disease. 3. The objection of the natives generally to vaccination no doubt adds much to the number of cases during an epidemic of variola, also to their severity and mortality. Want of cleanliness, in their persons, houses, and villages, adds to the severity and fatality from other diseases, and I believe the water they use, which is generally through the district "hard," is a principal cause of calculous affections. 4. The 4th troop, 2nd Brigade H.A. was at Peshawur before coming to this station; also the 4th Company, 2nd Battery F.A. The men of the troop joined it in Peshawur in August 1857; they were volunteers from the several Queen's regiments there at the time, and the majority of them had been there for two years. The battery had been in Peshawur for five years, and arrived here on the 7th April 1859. The troop marched from Peshawur on the 15th September 1857, and arrived here on the 25th September 1857; the men suffered severely from intermittent fever in Peshawur, and for the first year after arrival here. The men of the F. artillery, who are principally old soldiers, did not suffer in Peshawur much, and have been healthy here. All parts of the men's accommodation at this station seem equally healthy. 5. The troops are not camped out at this station. 6. I have not been in charge of any hill station. Judging from my own experience of Murree convalescent depôt as a residence for convalescents, I would say that for the few months preceding the rains, and for the few months after their termination, a residence for those free from organic disease is of the greatest benefit, but for the great majority of people I do not believe it is healthy during the rains. 7. My experience of the hills is founded on the observation of men of the 4th troop, 2nd Brigade H.A., who were sent up to Murree as convalescents at the commencement of the season. A residence there certainly helps to get rid of the intermittent fever contracted in Peshawur, which depends on malaria, but I do not think it affords any protection against the liability of attacks of fever of other kinds when the soldiers return to the plains, or against the attacks of other diseases. 8. I decidedly approve of hill stations, but I do not believe that every altitude will be found equally healthy. 9. At Murree convalescent depôt, diarrhœa (diarrhœa alba) is prevalent during the rains, and the convalescents all suffer more or less from it.

References to Subjects and Queries.	Replies.
IV. *Health of the Troops —cont.*	10. As the diarrhœa attacks officers and soldiers indiscriminately, I am not prepared to say what precautions are necessary, but as the disease generally comes on during the rains, I would recommend that each man going to the hills should have under-shirts and drawers of flannel, and that regular exercise be enjoined. 11. My only experience of hill stations is Murree, and I should say that the best seasons for residence there are from the 15th April to the commencement of the rains, and from the termination of the rains to the latter end of October or early in November. I am not prepared to say what is the shortest period for enabling the troops to receive the full benefit of a residence at the hills. 12. So far as my experience goes there is no period beyond which injury to health is likely to be inflicted. 13. There are no special precautions on returning required that I am aware of, beyond the ordinary ones for soldiers serving in the plains. 14. For troops serving in the Punjab and in some of the stations of the N. W. Provinces, I do not think there is any necessity for sending an entire regiment for change to a hill station, except possibly in some emergency, such as where a regiment has suffered severely in Peshawur; but even in such a case I believe that a change to some other healthy station, such as Rawul Pindi, Jullundur, Sealkote, Umritsir, which are conveniently situated with regard to any of the more unhealthy ones, would be attended with as favourable results, and I think that in the Punjab and N. W. Provinces, the present practice of selecting those men from each regiment for whom a residence at a hill station is considered necessary, as fully ensures the efficiency of a corps, as if the entire regiment had been sent to a hill climate. For troops serving in Bengal, I would think that a residence at a hill station with short service in any of the Bengal stations, would be most conducive to the health of the men. I do not think frequent change on the plains is necessary, except from unhealthy stations, in which case a change of station is certainly beneficial to the health and spirits of the troops. 15. I have not sufficient knowledge of the accommodation afforded at Murree convalescent depôt to say whether it is sufficient. 16. I do not know at what elevation the most suitable sites may be obtained. 17. I believe there is no high ground near this station better than Murree. 18. Deep loamy soils, retentive of moisture, are generally found to be unhealthy for the accommodation of large numbers of men. 19. Soldiers proceeding to India should never leave England under 20 years of age, and the cold season is the best period for them to land. I had charge of the recruit depôt at Chinsurah in 1856, and the barrack accommodation for the recruits was good; they were well provided with clothing, and their duties were in no way severe. Recruits should not be allowed to remain in any of the presidency towns, but should be marched up at once from the ship to some of the neighbouring stations. Especial care should be taken to prevent exposure to the sun or the use of bazaar spirits, fruits, &c. The allowance of rum should be stopped altogether, and beer only given in moderate quantity, and never early in the day. 20. If recruits were selected specially for Indian service, and not sent out under age, I do not think there would be any necessity for sending them to any intermediate station. I think the present way of disposing of them on landing answers well; I believe the great sickness and mortality amongst young soldiers to be caused in the great majority of cases by their own imprudence, either from exposure to the sun, unnecessary exposure at night, or the immoderate indulgence in spirits. If the young soldier would be restrained from these exposures, I am sure the sickness, &c. of their earlier years of service would be much diminished. 21. I had charge of a party of recruits from Calcutta to Allahabad conveyed up the river by steamer and flat. The commissariat supplies were very good, there was sufficient room for the men, and a sufficiency of medical stores and hospital clothing. 22. As a rule a soldier should not serve in India more than 10 years. 23. The manner of conducting medical boards is such as to avoid conflict of opinion. I have no suggestion to offer on the subject. 24. The best time for invalids to leave India is in January or February, so as to arrive in England after the termination of the winter months.
Diseases.	1. Weekly inspections for the discovery of disease are made at the hospital in the morning at the visit of the medical officers. 2. There has been no scorbutic disease among the troops. 3. Out of 282 cases admitted into the artillery division hospital during the past year ending 31st March, there were 11 cases of hepatic disease. The disease in the majority of cases was of a chronic nature; the old soldiers were principally affected with it, and it did not seem to depend on other diseases. Men who had been at some time of their lives free livers were the principal sufferers. As I believe hepatic disease is produced as readily by habitual free living and the excessive use of animal food, as by intemperance, I think that in a tropical climate soldiers should as far as possible be prevented from consuming the amount of animal food they do. 4. I have never seen a case of dracunculus in a European soldier. 5. During the past year the proportion of venereal cases to the total sick in the hospital of the artillery division was 48, out of 282 admitted. With a view to diminishing venereal diseases, I would suggest that the prostitutes, both in regimental bazaars and in the sudder bazaar in cantonments, should have their names registered, be examined by a medical officer, appointed specially for this purpose, and receiving a special salary; the examination to be made at least weekly in stations where there are European troops, and those women found diseased, to be admitted into hospital, treated, and not to be discharged till cured. The cantonment magistrate ought to have authority to punish prostitutes (other than those registered) found in regimental or sudder bazaars, as also those women who are reported by the medical officers as trying to conceal the disease. If means such as these were taken, I believe there would be but little venereal, and a number of men who are annually invalided for chronic rheumatism, generally dependent however on former venereal diseases, would still be serviceable soldiers. 6. The following are the epidemic and endemic diseases arising at this station:— Those who have suffered at Peshawur from intermittent fever have it also here for some time after their arrival. Any other fevers are generally of the continued form, and are the result of imprudence or exposure.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases.—cont.*	*Dysentery* is generally produced by exposure, but is not either epidemic or endemic here. *Cholera.*—There was an epidemic of cholera in this station in June 1858, principally, however, attacking natives, amongst whom the disease was very fatal. *Small-pox.*—There has been no small-pox since I have been here, not since 1857. *Rheumatism.*—There has been very little rheumatism, either epidemic or endemic; the great majority of rheumatic cases are dependent on former venereal disease. The native syces and grass cutters suffer from rheumatism a good deal, but this might be expected in any station, the nature of their duties being attended with much exposure. During the year ending 31st March 1860, the total number of admissions into the artillery division hospital was 282; out of these there were admitted, of fever cases 26; dysentery, 4; cholera, none; small-pox, 1; rheumatism, 40; but no deaths from any of these causes. In allusion to these cases of rheumatism, I may add, that I believe every case almost without exception was of venereal origin, as was easily found out by the history and symptoms. 7. I have had no experience of zymotic diseases affecting the European troops at this station. Small-pox and measles are generally found at the commencement of the hot season. I have no experience of the atmospheric conditions which precede or accompany zymotic disease. 8. The duties, &c. of the troops at this station do not predispose them to epidemic disease. 9. Quinine has not been tried as a prophylactic; this station is free from malaria. 10. Should any epidemic appear amongst Europeans, the best way of mitigating it, as proved by experience, is to send the men, so far as can be done, into camp, and let them continually change their ground.
V. Intemperance.	1. The soldiers at this station are temperate, and there are no confirmed drunkards in the 4th troop 2nd Brigade H.A. A case of habitual drunkenness has not occurred for nearly two years. 2. The proportion of admissions into hospital directly caused by intemperance is 7 out of 282 during the last year, and indirectly 1 out of 282 in the same period. I cannot obtain sufficiently accurate returns for a table showing the effect of intemperance on sickness, mortality, and crime. Drunkenness *per se* is punished as an offence. 3. Rum is sold at the canteen, not in the regimental bazaar. Two drams of rum is the limit per man, and then only provided no malt liquor is drunk. Spirit is not part of the ration, and is not given to convalescents. No drinks injurious to health are allowed to be sold in the canteen or bazaar. 4. I should say the consumption of spirits is more injurious to health than otherwise; it is not conducive to discipline or efficiency. 5. It would not be beneficial to restrict or abolish the use of spirits, as the European soldier would then procure bad liquor from the natives. On a campaign or line of march it is most necessary. 6. Malt liquor is preferable to spirits. 7. Coffee, tea, lemonade, &c. are drunk at the station. 8. For the reason already given it would not be beneficial to suppress the use of spirits. 9. I do not think it would be beneficial to permit only beer, tea, coffee, &c. to be sold in the canteens. 10. I would recommend that the use of tea, coffee, &c. be encouraged as much as possible, and that a good supply of malt liquor be kept up. 11. Rum is issued at 1 anna per dram, and malt liquor at 1½ annas per imperial pint. No rum is issued before sunset. No man is allowed more than 2 imperial pints of malt liquor daily, the second pint being issued after sunset; and 1 dram of spirits, or 2 drams of spirits, and no malt liquor.
VI. Diet.	1. The ration for European troops in the Indian army consists of bread, meat, vegetables, rice, sugar, salt, tea, and coffee, namely, 1 loaf of bread, 1 lb. of meat, 1 lb. vegetables, 4 ozs. of rice, 1 oz. salt, 2 oz. sugar, ⅘ oz. of tea, 1⅘ oz. coffee. Tea and coffee on alternate days; mutton twice a week; beef other days. The ration is inspected by the subaltern officer on duty. 2. A complete ration is issued, including a due proportion of vegetables, but no fruit. The stoppage is 3 annas, 4 pice. The soldier has 3 meals a day; breakfast consists of bread, tea or coffee, and milk; dinner, of meat, potatoes, soup, vegetables, salt, and rice; tea, of bread, tea or coffee, and milk. Breakfast is at 8 a.m.; dinner at 1 p.m.; tea after evening duty. The vegetables constituting part of the ration are,—potatoes, ½ lb., cabbage, onions, and turnips, ½ lb. 3. An increase of potatoes, and a superior description of vegetables, would be conducive to the health of the troops. The rations are given over to the charge of a mess corporal and orderly, who are responsible for them. 4. Three pounds of wood are furnished per man for cooking, and the apparatus consists of cookhouses, dekchies, frying pans, gridirons, ladles, and choppers. The kitchens are clean and well ventilated, and sufficiently supplied with water. The meat is both boiled and roasted. The cooking is well done, and sufficiently varied, and the tea and coffee are properly prepared. The men have refreshment before a march if they choose to purchase it. 5. Gardens would be an advantage if the men could be induced to work in them. A piece of ground might be told off and placed under the superintendence of the officer commanding the troop or company.
VII. Dress, Accoutrements, and Duties.	1. The parts of a soldier's dress are a full-dress helmet, jacket, undress jacket, overalls, gloves, boots (2), wicker helmet, cloak, forage cap, 2 khakee tunics, 2 khakee overalls, 6 white shirts, 3 flannel waistcoats, 6 pairs socks. I consider the dress suitable, with the exception of the full-dress helmet; the men are sufficiently protected while on guard.
Duties.	1. It would be most advisable that the men should be thoroughly drilled at home before being sent to India. 2. The routine of duties consists of morning and evening parades. The length of drill varies according to the season. Far from suffering in health from drill, a moderate amount has the best possible effect. The best hours are early in the morning, and there are general orders respecting them; the average is 9 or 10 nights in bed (between guards?). 3. Guards are mounted close by the barracks, and last 24 hours. There are roll calls by day and night; night guards in some localities must be injurious, but not at this station.

RAWUL PINDI. BENGAL.

References to Subjects and Queries.	REPLIES.
VIII. INSTRUCTION AND RECREATION.	1. There are no ball courts, skittle-grounds, day rooms, gardens, workshops, theatre, nor gymnasia. There are schools in the European regiments, and in the 4th troop, 2nd Brigade H.A. No library is yet built, but some portions of the barrack are divided off for a school room, library, and reading room. Workshops and places of amusement for the men are much wanted. During the hot season the men are prohibited from exposing themselves to the sun during the day; this is in my opinion attended with the best results, as some, indeed nearly all, the cases of fever are in this station found to be produced by exposure of some kind or other, fevers caused by exposure to the sun being generally the most serious. 2. Workshops, skittle-grounds, ball courts, and gardens would be beneficial. 3. There is a savings' bank. 4. The verandahs in the barracks are good for enabling the men to take exercise in the shade; trees are small and few.
IX. MILITARY PRISONS.	1. The military prison is not completed.
X. FIELD SERVICE.	1. There are no local regulations for field medical service. 2. Any suggestion the medical officer may offer with regard to the sanitation of troops, whether in cantonments, in camp, or on service, always meets with prompt attention from the military authorities, and is carried out as far as practicable. 3. Any suggestions of the medical officer with regard to military regulations in camp is always acted on. It is the duty of the medical officer to report any circumstance in camp likely to affect the health of the troops, and such report always receives due attention. 4. A field hospital is formed at the rear of the force, and in the most eligible position, and under the charge of the senior medical officer, assisted by a sufficient number of medical officers. I believe there are no special regulations on this subject.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. No information.
XII. HOSPITALS.	1. There is no hospital specially for the artillery. The sick from the division occupy one ward in the European infantry hospital. 2. There are no stables near the infantry hospital, which is situated on the left rear flank of the barracks. It is 500 yards from the bazaar, and there are no houses near. The site is open and freely ventilated. There are no buildings, trees, or walls to interfere with ventilation. The site is healthy as to elevation, drainage, &c. 3. A well in the hospital compound affords an abundant supply of most excellent water. 4. No rain water collects. The water from cook rooms and bathing room runs into cesspools, which are emptied daily. 5. The building is one-storied, and raised two feet from the ground. There is no ventilation under the floors. No provision is made for carrying away the rain water, but from the natural fall of the ground it soon runs off even after the heaviest rain. The hospital is built of similar materials to the barracks. The walls are single, 2 feet thick, sufficiently so to keep the wards cool. The roof is also single, with ridge ventilation. There is an inner verandah 12 feet in breadth, and an outer one 8 feet, which, with the help of chicks, are sufficient shelter from the sun's rays. The inner verandahs are never made use of except in special cases, as the ward is sufficient for the accommodation for the sick from the division. The hospital is only a one-storied building. The following Table shows the hospital accommodation :— Date of construction, 1853 to 1857. Total number of wards for artillery division, 1. Total regulation number of beds, 20.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
1	20	66	24	24 Under roof framing.	38,016	1,900	95	2	6	Ft. In. 2 3	4

The hospital is so placed as to receive the benefit of the prevailing winds; the windows open on a pivot hinge by ropes attached to them. They afford good ventilation.

6. There are doors on each side and opposite each other. There are windows and ridge ventilation. The wards are always well ventilated. There are no jalousies or jhilmils.
7. Tatties are used for cooling the air admitted into the ward in the hot season, and also punkahs.
8. There is a fire-place in each verandah of the ward. The walls are whitewashed once a year, at the commencement of the hot weather, but oftener, at the requisition of the medical officer, should he consider it necessary.
9. The privies are in the rear of the ward, and at a sufficient distance from it. The passage to them is roofed over. They are not over cesspits, but the filth is carried away daily, and as a rule they are not offensive.
10. There is a small washing room in each wing of the hospital; they are not in my opinion sufficient for the sick, nor are the utensils nor the furniture in these rooms of such a kind as to afford facilities or comfort for the patients in washing themselves.
11. There is a plunge bath in each wing of the hospital, but it is never made use of, as it is not considered beneficial to the patients in hospital.
12. To each of the hospital establishments of the troop and battery there is a dhobie attached; he washes and dries the clothes, and is always able to have a sufficient quantity clean and ready for immediate use.
13. At present the storage for the clothing, medical stores, &c., of the artillery division is not sufficient; they are placed in the verandahs of the ward occupied by the sick, and in the plunge bath room.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	14. The bedsteads are made of wood with tape stretched across; both these are highly objectionable as beds for hospital or barrack use. Those furnished are cumbersome, unsightly, and after a short time become filled with bugs, which are a cause of the greatest discomfort to the patients, and in some cases, from the loss of sleep they produce, occasion positive injury. The tape is objectionable as being easily dirtied, and in case of an epidemic, requires to be destroyed. Light iron bedsteads, similar to those used at home, both in military and civil hospitals, are the proper ones, being lighter, cleaner, and just as comfortable. The bedding I consider well-suited to the climate, and quite sufficient for all the wants of the patient. 15. The hospital kitchen is well to the rear of the ward; its construction is similar to those in barracks. 16. There is no annual return of sick in store. The number of men invalided is forwarded in the annual return. The diet rolls, &c., are forwarded. 17. In the artillery division hospital there is a hospital serjeant, besides the usual allowance of native servants. The attendance thus afforded is quite sufficient for the wants of the sick. 18. The sanitary condition of the hospital is good. No epidemic, gangrene, or pyœmia have appeared in this hospital since I have been in Rawul Pindi. 19. I consider that bath rooms, such as have been recently erected at the rear of each barrack, would be of the greatest use to the patients in hospital. 20. For ordinary cases of convalescence the hospital compound and verandahs afford sufficient room for patients taking exercise, but there are no shaded walks or seats set apart for them. Trees have lately been planted. In special cases, on the recommendation of the medical officer, doolies and bearers are supplied by order of the brigadier, for such patients as may require them. 21. The wives and children of soldiers when sick are admitted into the hospital where there is a ward specially for them. The present arrangements are satisfactory. 22. There are no special local hospital regulations. 23. All matters relating to the sanitary state of the hospital and its repair are attended to on the requisition of the medical officer. The liberal allowance of diet and all medical comforts for the patients in hospital saves the medical officer from all trouble on these subjects. 24. There are no wards for convalescents specially, and except in contagious or infectious diseases, I do not think they would be necessary.
XIII. Burial of the Dead.	1. The burial-grounds are in the station, but at a considerable distance from the hospital and barracks; they lie out of the direction of the prevailing winds. 2. The area is 321 × 176 feet. The soil, &c. is the same as the station generally. Decomposition takes place readily, and the ground is carefully kept. 3. The grave space allowed is 6½ × 2½ feet. The interval between the graves is 2 feet. The depth is 5 feet, and no grave is re-opened. Burial takes place in ordinary times in 24 hours, and during epidemics as soon as possible. 4. The graveyard is never offensive; funerals take place early in the morning, or in the afternoon when the sun has lost power. 5. The dead of camp followers or bazaar people are burned or buried outside the station. 6. No injury to the public health accrues from the present practice. 7. I could suggest no improvements.

(Signed) C. L. Cox, Major, Commanding 4th T. 2nd Brigade H. A. and Artillery Division.
James Brown, Assistant-Surgeon in Medical charge of Artillery Division.

Rawul Pindi, 14th May 1860.

(Captain Davies, Executive-Engineer, is on duty at Murree. The Topography and part of the Sanitary State of the Station, also that part relating to the Public Buildings, have been furnished by him.)

MEAN MEER.

Accommodation	European Troops	Artillery	301	Head Quarters and 1 Troop.
		Cavalry	476	1 Regiment.
		Infantry	1,437	1½ Regiments.
	Native Troops	Cavalry	627	1 Regiment, Irregulars.
		Infantry	638	1 Regiment, lines for 4 Regiments.

N.B.—With these numbers the barracks are crowded.

References to Subjects and Queries.	Replies.
I. Topography.	1. Surrounding country a flat arid plain, sloping towards the river Ravee (Hydraotis) as it approaches it to the N.N.E. The country around the cantonment is partially cultivated with wheat, millet, dour, Indian corn, mustard, cotton. Beyond this is a low jhow jungle, *Tamarix Indica*, and the common wild plants and shrubs, saline and others, usually found in the arid, waste saline tracts of the Punjab, viz., *Aloe, Salvattora Persica, Currile, Capparis Aphylla, Lana*, a creeping shrub, a *salsolaceous* plant, prickly camel-thorn, some scattered shrubs of the mimosa species, &c. The country is sandy and dry. There is only low jungle, very few trees near. The Ravee is about seven miles distant from the centre of the cantonments. The Baree Dooab canal (lately opened) is about 2½ miles distant.

MEAN MEER, BENGAL.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	2. Mean is 1,128 feet (ascertained) above the level of the sea. It is 8 feet 6 inches higher than the civil station at Lahore. There is no higher or healthier ground near the station. 3. The nearest mountain range is about 100 miles distant. 4. The Ravee, seven miles off, overflows its banks in some seasons in July or August, and floods the surrounding lands. The highest flood recorded was to a level 11 feet 6 inches below that of Mean Meer. The inundation usually subsides in a few days. The only broken ground has been caused by railway earth-works and digging a canal, in the course of which high roads and pathways, and heaps of earth, have been made, and hollow excavations left where rain-water may accumulate for a time. 5. The station is remarkably open. Trees planted along the road sides are as yet small. There are one or two gardens only with trees and shrubs of any size. The garden boundaries are low mud walls, 3½ to 4 feet high. The houses are one-floor bungalows; the outer walls, 22 feet high, surmounted by a flat roof, in a few instances with a pent thatched roof. There may be some little heating of the air from the reflected sun's rays off the barracks and bungalows, but the effect of this cannot be much in so large a plain with unimpeded ventilation. The warmth of the atmosphere is most sensibly increased by the greatly heated state of the hot, baked, and hard metalled roads, after any continuance of drought. A cold north-east wind blows during the cold weather months, which augments considerably the sensation of cold to the feelings. 6. The country surrounding the station is scantily cultivated; in the vicinity of the Ravee there is more cultivation. The noble canal lately opened, and running two miles distant from the station, is intended for irrigation. Its effect on health has not yet been tried. There is no rice cultivation in the neighbourhood, nor is there any of indigo, flax, or hemp. 7. The nearest large city is Lahore, six miles off. The cantonment Sudder bazaar, with a population of 7,338 men, women, and children, is nearly two miles from the centre of cantonments. There are four or five other bazaars within cantonments placed near to their respective regimental lines; these are small excepting the bazaar of artillery. 8. As regards the local geology:—The soil is alluvial. The subsoil consists of layers of loamy clay, suited for brick making; of sandy loam; of pure white micaceous sand, resting on a bed of bluish, ochery, ferruginous, stiff clay, through which the well water rises up from a bed of dark sand. The upper stratum of clay, at a depth of two or three feet from the surface, and extending to a depth of 10 or 12 feet, is embedded with nodulated limestone or kunkur in small pieces, very like fragments of coral formation. The surface is much covered with a white efflorescent salt, with which the soil is much impregnated. This appearance is increased on ground which has been saturated with water, during and after the drying process. The soil has been professionally analyzed, and found to be constituted like the water; to contain, in pretty much the same relative proportions, carbonate of soda and lime, sulphate of soda, chloride of sodium, and carbonate of magnesia. The environs of the city of Lahore, with its buildings, approached originally very near to the site of Mean Meer. There are very few vestiges of the city now nearer than four or five miles. 9. The depth from the surface at which water stands in the wells averages 40 feet in the dry season. On an average there are about 15 feet (varying from 8 or 10 to 20 feet) of water in the wells, except during periods of great drought. There is a slight increase of depth of water after much rain. 10. The rain-water, for the most part, runs off rapidly by means of a well-arranged system of drain cuttings. It lies, however, in places for some hours, not disappearing very rapidly through the loamy soil. Its clearing off is facilitated by small cuttings directed towards the nearest drain. There is no higher ground the drainage of which passes into the subsoil of the station. 11. The water for the station is obtained from wells, and is filtered before drinking. It is not stored in tanks. There are two water-tanks only near the bazaar. They are hollows, the results of excavations for buildings. Filled by rain-water, partially dry during the dry season. The bazaar people bathe in these, and may drink the water. The water supply from the wells is not liable to pollution from leaves, &c. No nuisance is experienced from the tanks alluded to. 12. As regards the amount and quality of the water:—It may be stated generally that there is a well to each bungalow. Sometimes there are two within the garden enclosure. For the infantry barracks intended for one regiment there are five wells, besides a well within each cook-room enclosure, used for the cooking of two companies. The water is, for the most part, good in quality, but some of the wells are brackish saline. The following is a professional analysis of the well-water:— 1,000 parts of water, after evaporation and incineration of solid residuum, yielded—

	Grs.		Grs.
Carbonate of soda - - -	0·494	Chloride of sodium - - -	0·095
„ lime - - -	0·140	Sulphate of soda - - -	0·178
„ magnesia - -	0·080	Silica - - - - -	0·013

The quantity of organic matter traced in the water is very small. The water I should call soft, from its ready admixture with soap. It agrees well ordinarily, and is sufficient.

Water is raised from the wells by the Persian wheel, or else in large skins drawn up by manual labour lightened by pulleys. Small masonry reservoirs have been built by the side of the well's mouth in some places for keeping a large supply of water ready for use, to supply the barrack wash-houses or plunge baths. These reservoirs, together with the well's mouth, are raised above the surface level. For ordinary domestic purposes, the water is brought from the well in leather skins by water-carriers or bheesties.

The vicinity of the canal would afford a water supply in case of need.

13. The roads are intolerably dusty, and should be watered as a sanitary measure. Considerable outlay would be needed in digging wells and making masonry conduits by the roadside. More care should be bestowed on the watering and culture of the trees by the roadside, and in replacing them when fading.

14. In selecting new stations, mixed committees of civil, military, engineer, and medical officers are appointed, who, after careful survey and investigation into all points of locality, topography, climate, diseases of its inhabitants, and all matters of hygiène, recommend the particular site or otherwise.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	The appointment of a well-selected medical officer as sanitary officer to each division of the army, whose business it should be to inform himself of all progress in all such matters, and whose recommendations should be imperative and unquestioned when not politically inconvenient, is most desirable, and would much expedite the present sluggish and often obstructive proceedings in these matters. This advice has reference to the selection of new sites for cantonments and encampments, as well as to ordinary requirements of hygiène and conservancy at stations.
II. Climate.	1. The station is wanting in meteorological instruments, and in the proper machinery and arrangements for keeping a reliable register of phenomena. There is a common thermometer at every European hospital, but I believe that it is carelessly observed. Representations on this head have been made to the principal inspector-general, medical department. 3. The climate is dry; in hot weather, within a room, the wet bulb falls 19°. The dew point stands at 46° 45′ F. Degree of saturation, ·236. The thermometer in a northerly covered verandah stands at 107° F. at 4 P.M. The range of the thermometer is 16° to 18° ordinarily; after a dust-storm the fall may be 19°. In the hot weather the thermometer falls 20° in 24 hours, after a heavy fall of rain. During the cold weather months, the diurnal range is much greater. Fogs during the cold weather are rare. A cold easterly wind prevails during the cold weather months, much increasing the sense of cold. Tree planting along the road side, and in clumps here and there on the plain, is salutary, in a bare arid spot like Mean Meer; irrigation has not been tried; trees are planted along the road sides. The atmosphere is loaded with dust. The soldiers are attacked with simple ardent fever at the setting in of the hot weather, and by heat-apoplexy in May, June, and July. Light cotton clothing of a greyish dusty colour is now generally adopted in the hot weather. The diet allowed is suitable. Drills should be light and finished soon after sunrise in the hot weather. The men should be strictly confined to their barracks from 8 o'clock A.M. to 6 o'clock P.M. A light basket work well-covered helmet should be worn to protect the head. From an analysis of the returns of European troops at Mean Meer, for four years up to 1858–59, I find that the hot months of May, June, and July are the most unhealthy months. The men suffer from fevers, common, continued, and intermittent; from hepatic and bowel complaints. September and October again are unhealthy months. Fevers continued and intermittent are rife, especially when malarious causes of diseases exist. In 1856, in August, a fearful cholera epidemic appeared, and continued until November. The deaths were very numerous. 4. There is no district near the station, I have ever heard of, the climate of which is more conducive to health than that of the station. 5. I have served for short periods at the following stations and cantonments:—*Ghazeepore*, for one year. *Dinapore*, for five months, during the rainy season. *Lucknow* cantonments, three months, cold season. *Dum Dum*, six months, during the rains. *Ferozepore*, six months, cold season. *Cawnpore*, for five months, hot weather and rains. *Meerut*, seven months, January to August. Of civil stations I have served at *Mymunsing*, in Eastern Bengal, 4½ years. *Moradabad*, north and south, for one year. *Hourah*, near Calcutta, 6½ years. *Midnapore*, two years. *Dacca*, eight years. As regards their comparative healthiness, I can only speak superficially. *Ghazeepore*, generally a healthy station. The troops of Her Majesty's 44th suffered much from cholera in 1836–37, while I was there as civil surgeon. Their barracks were bad, confined, ill-ventilated; the conservancy was bad. Situated on the banks of the Ganges. *Dinapore*, in 1847, considered unhealthy. Is on the river bank. Dysentery prevailed much among the troops. The cantonment parade ground is flooded, and a good deal under water during the rains, and high rise of the rivers. Fevers abounded among the sepoys at that season. *Lucknow*, then three or four miles distant from the city upon a sandy plain, was healthy. *Dum Dum* was not remarkably unhealthy during my residence there. Deaths from apoplexy and fever occurred largely among the recruits, in consequence of reckless exposure to the sun, and excess in liquor. *Ferozepore* is a healthy station. *Cawnpore*, a notoriously unhealthy station in 1849; some localities were more unhealthy than others. Cholera prevailed fearfully among the European troops, infantry, while I was there. The hospital and barracks were placed on the banks of the river. The drainage of the native town, which stood on a higher level inland, ran down into the river close by the barracks. Amongst the European artillery of which I had charge, whose barracks were higher and better placed in every point of view, cholera did not prevail nearly to the same extent. *Meerut* was healthy during the time I was there (1850).
III. Sanitary Condition of Station.	4. The following is a Table of the barrack accommodation:— Date of construction, between 1850–57. Number of barrack houses, 16, with 8 married barracks and two iron-framed barracks.

Number of Barrack Rooms.	Regulation Number of Men per Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Contents in Cubic Feet.				Number.	Height.	Width.
		Feet.	Feet.	Feet.						Feet.	Feet.
96	16	48	24	24	27,248	1,703	72	About 2 ft.	6 doors, 6 lights over door.		
Verandahs, 96	8	—	—	—	—	—	—	—	—	4	2
Iron-framed Barracks, 4	52	95	44	To eaves 14 To ridge 26	103,400	1,980	80·5	Do.	2	—	—
Guard-room	16	42	18	16	12,096	756	48	Do.	6 doors, 6 windows.	—	—

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	There is a dining-room for 104 men in the centre of each iron-framed barrack. It is 60 feet long, 26 feet wide, 26 feet high in the sides, and 33 feet high to the ridge. 5. As regards windows:—The windows or lights are situated high up in the two main inner walls of the barrack, along the whole length of the building, on either side and opposite each other. They swing open on a central pin or rod. The arched openings between the central apartment, or nave of the barrack, and the inner verandah, as well as the large doorways, and the arcaded outlets of the outer verandahs are all opposite, so as to favour the passage of free currents of air through the barrack from east to west. There are outer verandahs on both sides lengthwise, and at the ends, 10 feet wide, and 14 feet 9 inches high, flat-roofed. They are not occupied as sleeping quarters by the soldiers. There are no jhilmils, the doors are panelled, with a glazed arch above. 6. The bed-cots are of wood, bottomed by a close interlacing of broad cotton tape, or nawar. The bedding (mattress and pillow) is made of stout country cloth, either dyed red or not, stuffed with hempen fibre or sunn. Cot well made, strong and comfortable. 7. Tents are made of stout cotton cloth. On the inner side, the roof is dyed blue. Dimensions:—Length of floor, 20 feet; length of ridge, 6 feet. Width, 16 feet. Height to the top of the two poles at the ridge, 12 feet. Height of the tent sides or kanats, 5 feet 4 inches. There are two roofs or flies; the outer one three cloths thick; the inner are two cloths thick. The kanats or side walls are three cloths thick. There are four doorways with cotton canvass screens or falling doors. The number of cubic feet, reckoning 9 feet as the height throughout, is 180 for each man; 20 superficial feet per man. Each tent holds 16 men. Ventilating and lighting by doorways, or by lifting up and laying open the side walls. 8. Ventilation in barracks is provided for through the ridge of the roof, by swing windows high up in the inner main walls, by holes in the roof of the inner verandah, covered over on the outside by the entrance doors. When the barrack has only its proper complement of men, and is not crowded, this ventilation answers the purpose. The ordinary means of cooling the air are punkahs, and *Kus kus* grass tatties. These last are thinly laid grass screens on a framework of bamboo, made to fill up and fit the doorway to windward, and kept wetted. The external heated air becomes cooled in passing through them. Punkahs, 20 feet long, and 2 feet deep, cost 20 rupees. A Kus kus grass tattie costs 4 rupees 4 annas. The erection of thermantidotes in all the barracks, by which currents of fresh air would be driven through the room and foul air expelled, would be a great improvement. A thermantidote set in brickwork costs 130 rupees. 9. The barracks are built of burnt brick with a cement of lime, sand, and pounded brick. Tents are made of cotton canvass. Temporary barracks may be built of sun-dried bricks, with a mud cement. Iron-framed barracks are now erected with a pent roof surrounded by masonry walls, with a verandah all round. The roof is overlaid with mats, upon a framework of split bamboo, and over this a thatch. 10. The barrack floors are made of kiln-burnt brick, set on end and resting on a concrete made of broken burnt brick, or of kunkur (nodulated limestone). Square or hexagonal tiles are also used for barrack and hospital floors. The floors are raised three feet above the ground level. There are no flues beneath them. 11. Barracks built of burnt bricks are hotter than those of sun-dried bricks, but, of course, more durable. The iron framed barracks are good, capacious, and airy. The executive engineer repairs barracks, and keeps roads and drains in order. The cantonment magistrate looks after the public gardens, watering roads, &c. The quick execution of repairs seems to depend on the amount of important work on hand at the time. The directing authorities in cantonment repairs are the chief engineer and the officer commanding the station. The cantonment magistrate has the charge of the Sudder bazaar. The regimental quartermaster has the charge of regimental bazaars. In sanitary matters, the commanding officer is advised by the senior medical officer at the station, Queen's and Indian army. Petty repairs of barracks and equipments not involving building are made by the barrack master, who is subordinate to the quartermaster general's department, under whose care all barracks are placed. Repairs and whitewashing take place annually. 12. The lavatories are about 60 feet distant from the barracks, with a covered way to them, and about 180 feet from the supplying well. Water is conveyed from an elevated reservoir at the well's mouth by a drain underground to the lavatory reservoir, part of the masonry platform, into which the basins are let. The water is turned into the basins by spring cocks; underneath the basins are pipes for conveying away the foul water to a drain. The bathing accommodation consists of a long shallow tank, with low walls, in which the men can lie down and bathe. The refuse water runs off by the general drain. Plunge baths of large size are now in progress of erection. The lavatories are of solid masonry, one to each barrack nearly. 13. Each cooking house has two rooms, with an open space between them within one enclosure; serves for one company. The buildings are of masonry, with tiled roofs. The rations are cooked by cook boys, who prepare stews, soup, and bouillé, fryed and baked meats. The cooking is done by low brick fire-places on the ground, and also by higher ones with gratings set in masonry and flues beneath. The refuse water is carried off by a drain to a shallow tank, whence it is removed daily. In some instances the refuse water is drained into covered cesspits. Clothes are washed by washermen in the river Ravee, and are returned daily, prepared. 14. The best description of recently erected privies, called surface privies, are partitioned off into seats, with moveable pans underneath, which are taken away by holes in the wall behind, and emptied into large iron air-tight cylindrical vessels, to be removed. All the vessels should be cleaned with wood ashes twice a day. The ground beneath has to be swept clean, but this ought not to be necessary, everything should go into the receptacles. Beneath the latrines are now placed, in some cases, newly adapted vessels with an outer iron casing, having an earthenware pan fitted into each, which is perforated with holes in the bottom, through which the urine passes into water, between the iron casing and the earthenware pan. 15. The barracks are lighted by oil lights, either affixed against the wall or suspended from the roof. Lanterns or lamps are used. 16. Barrack drainage. There are no drains immediately about the barracks. There are servants employed to sweep the barracks, and remove all accumulations of refuse from their

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	vicinity. The lines of barracks are drained by two shallow saucer drains of masonry running the whole length of the barrack frontage, and emptying themselves into the roadside drain which skirts the barrack ground. These drains, running one between each two rows of barracks, are distant about 250 feet from each line of barrack, and are intended to drain the ground and to carry off quickly rain water. In some parts, where the level is unfavourable, rain water lies for some hours; small shallow cuttings, however, are made from the barracks into these saucer drains. The rest of the drainage has been described. The lavatory cesspools sometimes overflow, and the ground around becomes saturated, and the atmosphere is tainted. The cesspool plan is universally condemned, and is being exchanged for small surface reservoirs, whence the fluid is removeable. No part of the buildings is damp. Rain lies on the surface for a few hours, till it evaporates or is absorbed. The cesspits for receiving foul water are just outside their respective buildings. They are from 30 to 40 feet deep, and 8 feet in diameter. They are situated 64 feet from the barracks and 180 feet from the wells. Occasionally they are opened and emptied. There are no foul ditches near the station. The drains are, upon the whole, kept clean. There are a number of paid men, under the orders of the executive engineer, whose occupation is to keep the drains clear. 17. Besides the men stated above, people are employed upon the roads to remove dung, &c., daily. The cantonment is kept clean. 18. As regards vegetation, the cantonment is very bare and arid. There are a few officers' gardens. There are no hedges, walls, &c., to interfere with external ventilation. 19. The bazaars are arranged, with reference to ventilation, with good broad roads, intersecting each other at right angles. The houses are of mud, with brick facings, two chambers deep, open in front, in some cases with neat wooden verandahs, in rows along the roadsides, low and flat roofed. The bazaar is kept clean. One of the main drains runs through the Sudder bazaar. The drainage is about to be improved by masonry saucer drains on the roadsides, which can always be kept clean. There is a plentiful supply of good water from deep and wide wells. There are three public privies outside the bazaar, well looked after. There are from four to five residents per house, of all ages. The artillery bazaar has a well. There are public wells near all the bazaars. The regimental bazaars have their own conservancy arrangements, under the control of the quartermaster. The Sudder bazaar is in the hands of the magistrate. The people are compelled each to keep his part of the bazaar clean, under penalty of fine, and they contribute towards paying an establishment for the purpose. There are ten public privies placed in different parts of cantonments. The inner apartments of the native houses must be dark and ill-ventilated. There is an upper story, consisting of small rooms, over some of the houses. There are private privies to the houses, which the owners are compelled to keep clean. There are no dung heaps within the bazaars. The only nuisance of any kind is smell from a small rum distillery, in the Sudder bazaar. This smell reaches the hospital and barracks at times. The removal of the distillery is the only remedy. 20. The Mean Meer slaughterhouse is under the commissariat. It is two miles from the centre of cantonments, consisting of the necessary sheds and buildings. Offal is carried away to a distance from the station, and does not create any nuisance. 21. With reference to bazaar horses, the grass cutters have lines assigned for their ponies near their regimental bazaars. They are kept systematically clean. The artillery lines have good broad streets, with the grasscutters huts along their sides. All manure is removed outside, and then collected and taken away by the people for their land. These lines are about 700 feet distant from the nearest artillery barrack, and from the hospital, to the westward of the latter. The conservancy is under the artillery bazaar authorities. 22. Horses are picketed in the open air, in double lines, with a low wall running along in front of their heads. They stand on a slope on raised ground. The lines are kept very clean. All manure is carried away from the lines. The horse lines are about 372 feet from the nearest barrack, which is to the east. They are about 330 feet north of the hospital. There are wells belonging to the lines, and masonry aqueducts for watering the horses. The horse lines of the two troops of artillery, and two regiments of European cavalry, run along the line of the barracks on the east towards the open plain, distant about 372 feet from the men's accommodation. 23. There being few women with the artillery and cavalry, the married quarters are large enough at present. Some married non-commissioned officers occupy the corner rooms of the men's barracks.
Officers' Quarters.	I. Officers live in detached bungalows, with enclosures or gardens around them of ample size arranged in double or single rows, forming the sides of a street. The drainage is a part of the general cantonment drainage.
IV. Health of Troops.	1. Mean Meer is ordinarily a very healthy station, that is, to troops at all acclimatized and not suffering from the effects of hard service. Judging from the only source available, viz., the Government dispensary returns, sickness in the neighbourhood and district is not met with in an exaggerated degree among the native population. In the crowded city of Lahore epidemics of small pox and measles appear almost annually. Small-pox is continually rife in some districts of the Punjab. 2. The most common diseases among the native population are fevers, intermittent for the most part, lung diseases, bowel complaints, acute and chronic dyspeptic complaints, ophthalmia, ulcers, and boils; rheumatism, venereal complaints. 3. The cheapness of food and the fine climate of the Punjab are conditions of healthiness among the native population. The amount of sickness varies in different stations, and would seem to be much influenced by the character of the seasons. Dry seasons are found to be the most healthy, and those in which the fall of rain is moderate and opportune in breaking long-continued drought and heat. Sickness follows in the neighbourhood of inundations, when the waters recede and leave a swamp under the action of the sun. The river Ravee near Lahore causes much sickness in this way.

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References to Subjects and Queries.	Replies.
IV. Health of Troops —*cont.*	4. Her Majesty's 51st King's Own Light Infantry were nine months at Kurrachee and Scinde before coming here. The regiment suffered much from a low type of Scinde fever, particularly a detachment stationed at Shikapore. There was a good deal of fever in the regiment after its arrival here in December 1858, during the hot months. Many cases occurred in men who had suffered at Shikapore. Otherwise the regiment has been ordinarily healthy at Mean Meer. The principal diseases have been fevers, chiefly intermittent, acute dysentery, and diarrhœa. The 79th Highlanders were in the field in Oude and Rohilcund during the hot season, 1858. Many deaths from heat apoplexy occurred. Remittent and common continued fever prevailed during the hot season, and increased when the regiment went to Futtyghur in June. At Cawnpore, to which the regiment moved, it suffered much from fatal hæmorrhagic dysentery. Since the regiment arrived here on April 9th 1859, it has been on the whole healthy. The common forms of disease being fevers, diarrhœa, hepatitis a few cases, rheumatism, and of pulmonary complaints, acute catarrh. E., battery R. H. A., having previously been engaged in service; were at Setapore from April to September 1859, occupying temporary thatched huts, where they suffered from fevers and dysentery. They arrived here in February 1860. 3rd European Light Cavalry was seven months at Allahabad, occupying bad quarters in sheds, huts, and bungalows, part of the time surrounded by indigo and other cultivation. They suffered much from Paludal fever, continued and intermittent, and from diarrhœa, The regiment has been healthy since its arrival at Mean Meer on March 27th 1859; but there were cases of heat apoplexy in June and July of that year, partly from high temperature, partly from crowding in barracks, and there were many recruits. 5th European Light Infantry were at Campbellpore nearly a year. Left 26th March 1860. Common continued fever was the prevailing disease. The regiment was not unhealthy otherwise, although the barracks were temporary raised buildings and confined. Have been healthy since arrival here on April 18th 1860. The state of the 51st, 79th, and 3rd European Light Cavalry on arrival here may be judged of by the numbers invalided a few months after arrival, viz., 51st, 12; 79th, 39, out of full corps. Convalescents were sent to the hills, of the 51st, 26; 79th, 4. The Mean Meer barracks are generally salubrious, but the neighbourhood of an offensive cesspool or drain has been known to bring on sickness and fever in one particular barrack. 5. Troops are not usually camped out here. 6. As regards hill stations, I append the remarks of an officer of some experience in them:— "As assistant surgeon with the 2nd Bengal Fusiliers, I spent the autumn of 1846 and summer of 1847 at Subathoo. During summer of 1854 in medical charge of hill station of Murree. In medical charge of hill sanitarium, Simla, for 1858 and 1859. The population of both these stations consists of retired officers and civilians on sick or other leave, with their families. At Subathoo my regiment, full of organic disease contracted in Scinde, suffered severely; there was also bad barrack accommodation, no sanitary measures, and indifferent rations. As a general rule, troops which come from a station where the seeds of organic disease have been laid are sure to suffer; otherwise a regiment, under proper precautions, is sure to be healthier in the hills than in the plains. The last three years, 1858, 1859, 1860, during which healthy regiments have been quartered at Subathoo and Dugshai, with good barracks, rations, and a better system, will be the best test of the value of these stations. 7. "Men leaving their barracks and the cool air of a hill station for ordinary camp life in the plains, suffer from febrile attacks at first, under the same causes as men entering the tropics from temperate climates; but this casual acclimatization passed, a regiment remains much healthier than one that has passed a hot weather in the plains. I should say the higher the hill station, the more men would be liable to these attacks in descending to the plains. For instance, I believe that troops making an ordinary march on the plains, after residing at Subathoo (4,000 feet), would suffer less than men leaving Kussowlie (6,500 feet), all sanitary measures being equal, and the season, with reference to the sun's power, being taken into consideration. 8. "I approve most strongly of selecting hill stations for troops. 9. "The disease peculiar to the 'Simla group' of hills used to be 'diarrhœa.' I believe statistics of the last three years, 1858, 1859, 1860, would show it much less prevalent now. In my two years' experience of Simla, under improved sanitary arrangements, the type of bowel complaints that used formerly to exist was very rare indeed; and when it did occur, it was much less formidable and more tractable than formerly. "All men, on first arriving at a high elevation from the plains, are liable to suffer from internal congestions, particularly of liver and bowels (children, of the chest), unless proper precautions be taken. "No hill station has yet been found to have perfect immunity from Indian diseases, cholera, bowel complaints, and fevers. 10. "As regards diet, &c., at hill stations, the rations should be, and I believe now are, of the best; quantity cannot be altered; vegetables are more plentiful than formerly. "Great care should be taken about clothing; nothing but woollen should be worn, except perhaps during May and June. A flannel belt should never be left off round the abdomen. The feet should be guarded by woollen socks during the rains, &c. As the sun's rays are very powerful during April, May, and June, good protection for the head is necessary. "Barracks should not be too exposed. A southern aspect for the higher ranges, and a northern for the lower would be best. They should be so built as to afford good shelter from the night air, and from drafts at all seasons, and yet have good ventilation. "Regular exercise should be insisted on; but the usual custom of men wandering down ravines, and to the bottom of the vallies, where the sun's power is intense, and the jungle always thick, should be interdicted. And again, a man walking in light clothing to the top of a high hill, meets a cold blast of air, which is often a cause of disease, and which soldiers of themselves are thoughtless about. 11. "At stations of the elevation of Subathoo (4,000 feet), residence is safe during the whole year. At the more elevated stations, from 1st April to 15th November. A hill residence of 7½ months, or from and to the above dates, would be sufficient for health. Troops would then have two months of bracing weather, from 15th September to 15th November, such as is hardly to be equalled in any country. The rainy season is always a trying one, and thus time would be given to recover from it. From neighbouring stations in the plains

References to Subjects and Queries.	Replies.
IV. Health of Troops—*cont.*	there are many men who would be saved much sickness, or a long convalescence, if they could have short leave to the hills for two months during the hot season. 12. "I do not think that troops would be injured physically by length of residence on the hills, but troops get weary of the monotony of the hills. Officers cannot be said to share this feeling, but it certainly exists among the men. I have, however, noticed many men of mature age, who have been resident for some years at 7,000 feet and upwards, to have the capillaries of the face injected, and otherwise to present a very florid appearance, but their numbers are too few, and their periods of residence too uncertain, to form any certain conclusion upon. I have not noticed any diseases peculiar to this class. 13. On leaving hill stations for the plains all camp comforts should be provided; not too long marches taken at first; guarding as much as possible from cold at night and from direct exposure to sun in day time. 14. "As regards the manner of using hill stations, I think service in the plains, with short periods of change to hill stations, would be most conducive to the health of the troops, mentally and physically; I mean a period of two or three years, the former, or even less, at an unhealthy station in the plains, and one year, or one year and a half, at the lower elevation, or the 7½ months at the higher elevation. "Change of stations on the plains would be decidedly beneficial; but I would say let troops remain at favourite stations for three years, at others for two. 15. "I am not acquainted with the present barrack and hospital accommodation of the hill station I formerly served in. At Subathoo in 1846–47 both were very bad. 16. "Medical officers have rarely dwelt long enough in the hills to be able to state what elevation is best for health from personal experience. "Statistics would probably give the truest information. I have always held the opinion that elevations of from 4,000 to 4,500 feet are the best localities for troops, for at this height there is cold enough to renovate the system, and the extremes of wet and cold are not so much felt, while at higher elevations few constitutions can stand the extreme and penetrating cold for at least four months in the year with impunity. But barrack accommodation, with reference to space, heat, cold, and ventilation, must be of the best, and good sanitary arrangements carried out. "The station of Subathoo is the only one in the presidency which answers to the above height. It may be described as an isolated level plateau, being drained nearly all round by steep descents, with the higher ranges of hills in a circle round it, varying in distance from 10 to 30 miles. A plateau of this elevation, without the higher hills round, would perhaps be better. It is hotter in summer and warmer in winter than the higher elevations; but the heat in a moderate building is rarely above 86° Fahrenheit. The nights are always cool, and out-door games and amusements can be carried on throughout, except perhaps for three weeks before the setting in of the rains, towards the end of June. The winter is not too cold. Snow falls about once in four or five years, but seldom lies more than three or four days. During the rains the station is under clouds, without being in them, or in fog, and the rain-fall is moderate. Up to the end of 1858 the station never had a fair chance, barracks and conservancy arrangements being alike deficient. "J. T. C. Ross, F.R.C.S., "Surgeon, 3rd regiment, Bengal European Light Cavalry." 17. There is no higher ground near Mean Meer which could be occupied as a hill station. 18. With regard to the comparative healthiness of different subsoils for stations, I have found a stiff clayey soil, retentive of moisture, particularly if drainage be neglected, productive of intermittent fever, followed by enlargement of the spleen. I have found sandy or light pulverizable loamy surface soils healthy, *per se*, independently of other associated causes of disease. 19. The best age for soldiers proceeding to India, about 20 to 23 years of age. Troops for the Bengal presidency should arrive during the two first weeks in November. On landing, troops are immediately sent off to the depôt at Dum Dum, Barrackpore, or Chinsurah. It is the custom to send off by steamer to the upper provinces, as quickly as possible, troops arriving early in the cold season. The barracks at the above depôts are good brick European barracks. Light clothing or otherwise according to the season is provided for and worn by the men on landing. Flannel waistbands are distributed in the cold season. Drills and duties are made light for the recruit. He is not exposed to the sun. The marches during the cold season, if he leaves Calcutta in that way, are not exhausting, but rather invigorating. The most necessary measures for preserving the health of the recruit on first landing, are preventing access to or excess in the use of spirits; preventing exposure to the sun; providing suitable clothing and airy commodious barracks; giving the men exercise; providing them with beer in lieu of spirits; and taking care that their rations are wholesome and good. 20. In sending healthy troops out to India, they should come out direct. If they arrive in India at the approach of the hot season, then send them to a hill station, provided the barracks there are good. If they arrive at the proper season of the year, they have the cold season before them to acclimatize in, whether they be moved upwards by steamers, or whether they march; in which latter case, the daily morning exercise is salutary and bracing. 21. The marches are from 10 to 12 miles, halting on Sunday. The men are supplied with regulation tents, each holding 16 men, giving 20 superficial feet to each man; a commissariat agent accompanies the troops, or else the men travel by a Government covered bullock cart train, travelling 30 to 40 miles during the cool of the day and at night; stopping during the day at caravanseras prepared for them. The carts hold six men each, and allow of their sitting or reclining. River steamers are used for transport from Calcutta to Allahabad, and intermediate places. The men on board are often crowded, and their comfort and convenience not sufficiently attended to in a sanitary point of view. 22. A moderately well conducted man should be able to serve in India from 10 to 15 years. 23. I have generally seen the business of invaliding committees consisting of five members satisfactorily carried on, and without any impediment in working. 24. Invalids should leave India throughout January.
Diseases.	1. Inspection parades for the detection of incipient disease are or ought to be held every week by surgeons of European corps. There may be more or less laxity in this respect.

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References to Subjects and Queries.	REPLIES.
IV. Health of Troops—*Disease—cont.*	2. Scorbutus is not a disease of this station. It has been spoken of as slightly indicated by the state of the gums, debility, &c., at the time when vegetables, more particularly potatoes, become scarce, as during very hot months. A provision of potatoes all the year round is desirable, if possible, but potatoes become unsound after June. Limejuice is plentifully supplied to the troops. Fruits of some kind are to be had at almost all seasons. 3. During the past three years the average occurrence of hepatic disease among European troops has been in the proportion of 3·86 per cent. of the strength, and in the proportion of 1 to 48·66 of all other diseases. Experienced surgeons attribute hepatitis ordinarily to exposure on sentry, or in the field to the extreme heat of the sun. Hard drinkers are undoubtedly predisposed to it. It is often co-existent with ulceration of the colon, but not invariably so. Evidence of disease in the portal system of veins and of the presence of pus in them has been looked for in vain, in many instances. It has been observed that soldiers conceal their hepatic disease, and come into hospital to die very shortly afterwards, sometimes in a few days; post-mortem examination showing large abscesses of the liver. These instances are generally found in drunkards. 4. Dracunculus is an uncommon disease here. During the past three years there is not one case recorded among European troops. 5. Upon the average of the past two years the proportion of venereal disease to all other diseases has been as 1 to 13. A lock hospital has been established at Mean Meer. The bazaar women have been all registered, and every week they are collected and examined by a surgeon, and if diseased are removed to the lock hospital. The returns of hospital of the last year show a diminished per-centage of syphilis among the men. 6. The prevailing fevers at Mean Meer are common, continued, intermittent (of various kinds), and remittent. Acute, chronic, and hæmorrhagic dysentery, sporadic and epidemic cholera, small pox, and rheumatism also occur. The following Table gives the proportions, in comparison with *all other diseases.*

Years.	Fevers.		Acute Dysentery.		Cholera.		Small Pox.		Rheumatism.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
1857–8 -	1 to 3·3	1 to 5	1 to 25	1 to 3·3.	Nil.	Nil.	Nil.	Nil.	1 to 17	1 to 10
1858–9 -	1 to 2	1 to 4	1 to 29	1 to 4	1 to 500	1 to 19	1 to 322	1 to 32	1 to 48	Nil.

	7. As regards nosological characters, the intermittent fevers are not commonly accompanied by spleen enlargement. The remittent fever is the ardent remittent, or ardent continued, often of short duration, and produced by heat. Bilious remittents are met with occasionally. Dysentery is of the acute kind. When small pox occurs, it is often observed to be imperfectly eliminated, and the vital powers sink under the disease. This is more especially noticed amongst the native population. The most unhealthy months are April, May, and June, and again September and October. In these, fevers and bowel complaints most prevail. According to common observation, the invasion of the hot weather ushers in fevers. Exposure to heat in barrack life and on duty introduces them, and brings on hepatitis. Vicissitudes and extremes of temperature tend to dysentery. I have no reason to attribute the appearance of disease to sanitary defects in the bazaars. The want of exercise and the inertia of mind of barrack life are causes favouring the inroad of epidemics and other diseases. 8. Under the conditions of a free and frequently changed atmosphere, and active exercise in the camp and field, and the pleasurable and energetic operation of the faculties of the mind at such times, the health of the soldier is observed to be more vigorous. 9. Small doses of quinine as a prophylactic in malarial diseases have been tried, and in the opinion of the regimental surgeons with effect. The men come up to the hospital for their dose every morning. 10. As regards local measures for preventing epidemics, these diseases are uncommon at Mean Meer. The outbreak of cholera at the station in 1856 is the only epidemic heard of here of late years. The cause of this remains unfathomed.
V. INTEMPERANCE.	1. The soldiers at this station are temperate on the whole. They consume a great deal of malt liquor in lieu of spirits. Crimes from drunkenness are certainly not numerous, nor is the occurrence of delirium tremens common. 2. The admissions from this disease among European troops during the past year have been 1 to 204 of the admissions from all diseases. The baneful effects of dram drinking are the growth of bad habits of years. The present corps here are mostly newly raised. Drunkenness, *per se*, is punished as an offence. 3. Spirits are sold in the canteen, but prohibited and guarded against in the bazaar. The quality is good, and is passed by a committee of officers before being disposed of to the canteen. Two drams of spirits per man daily is the quantity allowed and sold to each man. At the station his ration is two drams of spirits and one pint of beer, or one dram and two pints of beer. On the march the same. In the field an extra ration of grog is given to the men. A morning dram is not now served out to the men. Brandy and other spirits are used curatively in hospital. A ration of spirits is not given to men in hospital, nor can they procure it. Pop (a sort of ginger beer), lemonade, and soda water, are procurable in the bazaar and canteen, and are bought by the men. The two first are often spuriously made, and so are injurious to health. 4. The men in my opinion would be more healthy than they are without spirits, and by the substitution entirely of malt liquor, except upon occasions of great exhaustion and depression of vital power, after fatiguing marches, chilliness from wet, &c. The use of spirits tends to the subversion of discipline and efficiency.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	5. It would, I think, be beneficial to health to restrict or abolish the sale or use of spirituous liquors. 6. My own opinion, and that of many experienced medical officers of European troops, is decidedly in favour of beer in place of spirits, as more compatible with a vigorous and healthy digestion, and more preservative of the general health. 7. There is in barracks an authorized shop for the sale of tea, coffee, &c., and these beverages are much used by the men, and may be had by them at early morning by purchase. Statistical evidence, showing the influence on health of such beverages compared with spirits, is very imperfect and incomplete. The abstinent man is, I believe, generally speaking, more endurant of fatigue, and less obnoxious to disease than the good liver, or he who is called temperate. 8. I think it would be beneficial to suppress the spirit ration altogether. 9. And to permit only beer, coffee, tea, lemonade, &c., to be sold to the troops.
VI. Diet.	1. The ration for Queen's troops, and troops of the Indian army, is as follows:— 1 lb. bread, 5/7ths oz. tea, or 1¾ oz. coffee, 1 lb. beef or mutton, 1 oz. salt. 4 oz. rice, 1 lb. vegetables, varying with the season, *i.e.*, 2½ oz. sugar, in the cold weather, potatoes, cabbages, cauliflower, turnips, carrots, lettuce, onions; potatoes fail early in June; they will not keep good longer; onions, and a species of green stuff, like turnip tops, are supplied when the others fail, as well as peas or dhal and pumpkin. The rations are inspected daily by the regimental officer on duty, and by the commissariat serjeant, and periodically by the commissariat officer himself. 2. The ration as above described is furnished to all the troops. Fruit the men must buy themselves. The stoppage is 3a. 4p., about fivepence a day for breakfast, dinner, and tea. The soldier has three meals a day; at eight o'clock a.m., one p.m., and five p.m. For breakfast meat, fried generally, bread and tea. For dinner the following, varying on different days:—Soup, or soup bouillé, stews with vegetables. Meat, fried or roast, or baked, with dressed vegetables, curries, pies. In the evening tea and bread. The men join in messes, and subscribe to procure little additions, such as butter, milk, eggs, spices, extra vegetables. 3. The beef is often lean, but is considered sound and good on the whole. Mutton is often bad, and often not taken by the men. A continuous supply of potatoes all the year round, if procurable, is desirable. Such a supply has been ordered for the hospital. Selling part of the ration is a crime not heard of in this country among Queen's troops. 4. Cook boys act as cooks, to whom each soldier pays 12 annas monthly. The men pay a trifle extra (two pice per meal) when they require their food cooked in a nicer manner, requiring extra ingredients. The kitchens are good, and as clean as they can be, with the smoke escaping by the roof from wood fires. There is a good well close by. The cooking is as varied as can be, and with a little looking after is well done. On march the men have tea and coffee distributed to them at a halting place. Each soldier on march should have his leather-cased bottle thrown across his shoulders, holding water or cold tea. No tea or coffee served before a march. 5. Gardens for the men would be very desirable, but their cultivation could not be left to the pleasure or the caprice of the soldiers. A Government establishment must be provided. Hitherto either commanding officers of regiments or stations have not been sufficiently earnest in urging their establishment, or the Government has not been liberally inclined in the matter. The former is, I believe, the preponderating obstacle. At some large stations good soldiers' gardens are now in existence, as at Ferozepore and elsewhere. There was a famous one at Lahore during Sir Henry Lawrence's time there, but it has since fallen into neglect and decay. As an instance of what can be done, the native prisoners throughout all India almost are now supplied with good vegetables of all kinds out of excellent gardens tilled by themselves. The management of any such gardens must be under the regimental authorities, with the sanction of the officer commanding the station.
VII. Dress, Accoutrements, and Duties.	1. The men wear woollen cloth in the cold season, and a light cotton cloth (khakee) in the hot months. The infantry wear a loose sort of smock and trousers in summer, and a cloth tunic and trousers in winter. The Highlanders wear their kilts, which the surgeon considers to be too hot for the country. The artillery and cavalry wear the same texture of clothing. The warm clothing being of blue cloth. They wear jackets and trousers. The accoutrements are the usual kind appropriated to each arm of the service. The head-dress now worn by each arm is a basket framework helmet, covered with wadded cloth, and surrounded by a light turban. The helmet projects behind, and protects the back of the head. The present dress, without neck stock, and loose, is suitable to the climate. Warm clothing should be worn on night duty, and at the change of the seasons, to avoid the baneful effects of sudden vicissitudes of temperature. As regards improvements in dress, the men should be provided with flannel shirts and drawers during the cold season; a flannel waistband is beneficial, as tending to avert visceral congestion, by maintaining active circulation and warmth on the surface; this especially in hill complaints and for old residents in India. The guard dress is the ordinary parade dress for the season with accoutrements. The men have their cloaks for protection against severity of cold and wet. They do not patrol in the sun.
Duties.	1. It is the opinion of experienced men that recruits, if drilled at the depôt at home, before coming out to this country, would be saved a good deal of harassing labour on their arrival, and be less liable to disease, and likely to do the Government better service. 2. With regard to duties. Drill is twice a day in the cold season. It is lessened in the hot season. Cavalry and artillery rub down their horses for a time. The royal artillery are kept a longer time at this than the Indian army artillery. The time of drill is suited to the season, so as to avoid exposure to the sun. The infantry have drills three times a week during the hot weather. They have daily target practice (one company at a time) for several hours morning and evening during the cool months. In the hot months the men are in their barracks by 6.30 a.m., and are prohibited leaving them during the heat of the day. The drills and parades are not injurious to health.

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References to Subjects and Queries.	REPLIES.
VII. Dress, Accoutrements, and Duties—*Duties—cont.*	The best hours for drills and parades are about sunrise and sunset. For marching through a dry healthy country, the early morning, before sunrise, is the best time, so as to finish the march two hours after sunrise in the cold season; but, through a low malarious country, and at a season of fogs, exposure to such an atmosphere before sunrise should be avoided. The troops should march later. Troops ordinarily commence their march some hours before sunrise. The number of nights in bed depends on the number of guards and the strength of the corps. The infantry here have 12 successive nights in bed, the cavalry four or five. The men do not appear to suffer from night duty. 3. Guards are mounted within the precincts of the barracks. The guards are relieved in the infantry every 24 hours. Sentries are on duty for two hours at a time. They walk under cover. There are morning and evening roll calls in the summer, at 6 p.m. daily, and at 5 a.m. every alternate morning, Sunday excepted. There are no night roll calls.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation provided at this station:—Skittle grounds, schools for some of the European corps, library and reading rooms, several theatres. There is a billiard room in the serjeants' mess. The men play cricket, chess, backgammon, bagatelle. There are no ball courts, day-rooms, nor soldiers' clubs; no soldiers' gardens, workshops, nor gymnasia. The men are not sufficiently provided with means and opportunities of employment, and the above deficiencies ought to be supplied. A double fives court is much needed. The men are strictly prohibited from leaving their barracks after the heat of the day has set in. 2. Together with workshops, photography, modelling, and drawing should be introduced. 3. Savings' banks for soldiers have been established, and have been of the greatest use. 4. As regards shade for exercise. In the immediate vicinity of cantonments there is not a tree except along the roadsides.
IX. MILITARY PRISONS.	1. There is no special prison. Provost prisoners are kept in rooms at the ends of the barrack, intended for bath rooms. They are kept clean. Each room has 2,000 cubic feet of contents. Ventilation by open fanlights over two contiguous doors. The rooms being part of the outer verandah are much exposed to the sun's rays. Those which receive the afternoon sun are not used unless absolutely necessary.
X. FIELD SERVICE.	1. I do not know of any local regulations for field service. 2. The medical officer may or may not be consulted on the march of troops, bivouacking, campaigning, &c. It is his duty to point out and protest against any neglect or disregard of proper sanitary rules or precautions. But the management of them is mainly conducted by the commanding officer and by his subordinate quartermaster's department. 3. Greater care than previously has of late years been bestowed on the selection and sanitary condition of camping grounds. Large serais have been built in the neighbourhood of the termination of each march, with a good water supply from wells. Dry camping grounds are chosen if possible at a distance from swamps and nullahs, or water channels. The route is chosen away from the neighbourhood of bazaar towns and villages, so as to keep liquor and disorderly temptations out of reach. To keep the men from damp a bedding of straw or grass is provided, over which a tarpaulin or blanket is thrown. Water carriers and other servants for cleansing and clearing the ground, &c., accompany the troops. 4. In times of war, field hospitals are organized, with a field surgeon and several assistant-surgeons, and a hospital establishment, European and native, with a large number of doolies for wounded, which are upon the whole the easiest mode of conveyance. Ambulances are employed only on good made roads, and are apt to come to pieces if taken across country. Field hospitals are on the plan and scale of regimental hospitals as to establishment. Hospital stores and supplies are obtained upon indent, upon the different departments, signed by the field surgeon and superintending surgeon. Camels and elephants are used for the carriage of tents, stores, &c. The Bengal medical code of 1851 contains the field hospital regulations in force.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. No information.
XII. HOSPITALS.	1. There are two large European hospitals built on the same plan. The infantry hospital is at the north-west corner of cantonments, the artillery hospital at the south-east corner. There are besides hospitals for native infantry and cavalry on the east and west facings of cantonments. The two European hospitals are situated on the open plain, between three and four miles asunder. The hospitals in both cases are separated only from 400 to 500 feet from the nearest barracks. The hospital enclosure wall is 330 feet from the nearest stables, and 700 to 800 feet from the regimental bazaars. The European hospital sites are quite open and good. The native hospitals are nearer their lines and bazaar. The European infantry hospital occupies an area of 60,000 square yards. 3. The water supply is abundant and good, and is obtained from a well within the enclosure. 4. The drainage of refuse water from washhouses and cook-rooms is either into deep covered cesspools or else into small shallow reservoirs, whence it is carried away daily. These receptacles are close to the hospital building. 5. The floors of the wards are raised 3½ feet above the level of the surface. There are no ventilating flues under the floors. The roof water falls on the ground, and escapes towards the drain by a slight fall. Surface drainage is effected by small channels cut to carry off the rain water towards the main drain, in the infantry hospital; but there being no main drain in the artillery hospital the water is conducted to the outside of the enclosure wall. The hospitals are constructed of solid masonry. The roofs are single, with ridge ventilation, and sufficiently thick. The wards are lofty. There are outer verandahs 10 feet broad on all sides, with closely set reed chick (a hanging screen), with or without the addition of cloth purdahs (hanging curtains), as a further protection from sun heat. The outer verandahs are not used for sick or others. But on one side the verandahs are divided into small compartments, to answer as washhouses.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	This bad system is detrimental to free ventilation through the verandahs, which ought to be open spaces. The following is the hospital accommodation:—E.1. Hospital. Date of construction - - - - 1854-5. Number of wards - - - - 10. Regulation number of bed in main wards - 160.

Wards.	Regulation Number of Sick to each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area per Bed.	Height of Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
10 - - - -	16	48	24	24	27,648	1,728	72	2	6 doors and 6 upper lights, 3 on each side and opposite.	—	—
Verandahs occupied by sick only under pressure or for purposes of separation. 20	8	48	12	16·75	9,648	1,206	72	2	—	—	—

The hospital is placed so as to receive the full benefit of prevailing winds.

The windows swing open, and are opened and closed at will by ropes, being situated high up in the main walls. These let hot air in as well as permit the escape of air from within, and are not calculated to promote coolness.

6. Ventilation is effected by doors, windows and ridge openings. In crowded hospitals these means would not be sufficient, but ordinarily, on account of the large space, they keep the wards free of odour and closeness. There are no jalousies or jhilmils.
7. Thermantidotes have recently been introduced for ventilating and cooling the air in wards. They consist of a fan wheel, 10 feet in diameter, with an iron axle, and are composed of seven wooden fans, each 4 feet 11 inches long, and 2 feet 6 inches broad. The axle works on two small wheels, fixed on each side in the wooden frame. The whole is enclosed in brickwork, with openings for two tatties behind. The fans are revolved by one man by means of a handle on the axle. Tatties are also placed in the doors to windward and kept well wetted. Punkahs are also used.
8. For warming, each ward has a fire-place in the side of the inner verandah at each side.

   Repairs and whitewashing are done annually. The hospital walls may be partially whitewashed every quarter, or it may be done after epidemics.
9. The privies are at the extremity of the hospital wings, and communicate with it by covered ways. They are rooms with front verandahs 27½ feet long by 12½ feet wide; eight seats in separate compartments. The side walls are 13 feet 3 inches high. The ridge is 17 feet high.

   Pans are used like those in the barracks, and are removed and cleansed in the same way. The filth is removed morning and evening in carts. Moveable urinals of iron, with earthenware pans, are placed in the verandahs. Lately pans with airtight covers have been introduced, into which the filth is emptied previous to removal.

   If the privies and urinals are kept clean they are not ordinarily offensive.
10. The lavatories are small compartments walled off in the outer verandah. They contain tables and basins, pegs for towels, and tubs of water. They are too small, badly placed, and obstruct the space in the verandah.

    A drain from these lavatories runs into covered cesspools outside. In the infantry hospital masonry platforms and benches have been built with a small runlet, reservoir, or sink at the back. The basins are placed on these benches, and the refuse water is thrown into the sink, where it passes into a drain and into the cesspool. Wooden gratings are provided for the men to stand on. There is a small space walled off at one corner of the lavatory sufficiently large for a man to sit in and wash.
11. There are slipper baths and tubs in the hospital for the use of the sick.
12. The linen is washed in the river Ravee, seven miles off, and is there dried, prepared, and brought back for use almost daily.
13. The store accommodation is scanty. The infantry hospital was built for one regiment, and has two stewards' establishments. At the artillery and cavalry hospital there are four stewards' establishments, without more accommodation than in the infantry hospital.
14. The cots and bedding are the same as those used in barracks.
15. There are two cook-rooms, one to each hospital wing of the infantry hospital. They have the usual Indian cooking arrangements: low mud or brickwork fire-places with side ledges, to support pans and kettles over the fire, as well as raised brickwork fire-places with iron gratings on the top, and underlying flues or passages for creating a draft under the fire, placed on the gratings. The appliances are sufficient to cook in the required variety.
16. The diet tables are those in the regulations, but besides the printed forms, there are numerous indents and vouchers for incidental and contingent and extra wants and supplies of a trifling nature, all requiring monthly the superintending surgeon's signature.
17. For attendance, a hospital serjeant and two hospital orderlies are allowed; a native nurse for the female hospital. There are a certain number of ward coolies allowed to attend on the sick (20 to a full regimental hospital). Usually there are enough. If more are required men from barracks are allowed.
18. The hospitals are splendidly commodious buildings. Improvements in cooling the air, in latrine and urinal arrangements, abolishing of cesspits, &c., are progressing. The ventilating arrangements are defective, on account of admitting hot air and dust. This could be remedied. Epidemic or hospital gangrene or pyæmia, traceable to defective hospital conservancy, have not appeared.

MEAN MEER. BENGAL.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	19. Daily removal of hospital excreta, and the so-called dry system should be adopted. 20. Convalescents take exercise on the open plains, morning and evening, conveyed either in carts with awnings, drawn by bullocks, three or four men in a cart, or on elephants six men to each. Men too delicate for this can be carried in a dooly by four men. 21. There is a female hospital within the same hospital enclosure, managed like the rest of the hospital. 22. The medical code contains all existing hospital regulations. Any others not found there are according to the custom or discipline of the regiment. 23. As regards the practical powers possessed by medical officers; it is the duty of the medical officer of the regiment, through the commanding officer, and through the deputy inspector general of hospitals near at hand, to point out earnestly and repeatedly any unsanitary conditions. He is the first moving agent towards bringing about the remedy, and should persevere until he succeed. He exercises the same influence in obtaining change of diet, increase of comforts, &c., in fixed hospitals, camps, and on the march. The intermediate controlling officers through whose hands his requisitions pass, secure a check over any licence of requirement. 24. There are no convalescent wards, and they are not required in such hospitals as those at this station.
XIII. BURIAL OF THE DEAD.	1. There are two burial-grounds nearly half a mile from each hospital. The atmosphere over them is not perceptibly tainted. 2. The infantry burial-ground has an area of 37,500 square yards, and the artillery ground of 10,000 square yards. The soil is the same as the rest of the cantonment, and is drained in a similar way. The chaplain may keep the ground in good order by application to the commanding officer at the station. 3. According to custom, graves are 7 feet long by 3 feet wide, with 2 feet between them. The Mohammedan burial-grounds are far beyond cantonments. They allow two feet between every two graves. For Europeans the depth of graves is 6 feet, one body in each grave. For Mohammedans 4½ feet, and one body per grave. Funerals of Europeans take place at sunrise, or half an hour before sunset. The funeral should take place on the day of death, if due notice has been given. Mohammedans bury a few hours after death. Hindoo dead are burned to ashes. The burning grounds are far off, beyond the boundaries of cantonments. The air is not sensibly vitiated on their account. 4. As regards the influence of burial on health. The European burial-grounds are not offensive. In Mohammedan grounds the body is often built over with bricks, burnt or unburnt, and earth is loosely piled over, slightly above the level of the ground. This soil is often removed by rains, and the body comes in contact with the air; hence these burial-grounds even in the vicinity of large native cities are often very offensive. At this station the grounds are too distant to be noxious. The civil authorities could enforce greater precautions in the burial of native dead. There are certain people who dig graves and prepare coffins for European dead, to whom notice is given by the hospital serjeant. Two graves are always kept ready. The local paymaster is authorized to issue a sum equal to a month's pay of the deceased on account of funeral expenses. 5, 6. No injury to the public health arises from the present practice of burial. 7. The chaplain could make convenient additions and improvements to the present arrangements, if funds were placed at his disposal.

These answers have been filled up with the assistance of the Executive Engineer, so far as relates to his department, and have been shown to the Commanding Officer of the station.

July 29th, 1860.

W. A. GREEN, Deputy Inspector General of Hospitals, Lahore Circle.

MEAN MEER.—FURTHER REPORT.

(Much of the information in this report for Queen's troops is given in the preceding report, and only such parts are abstracted as throw additional light on the questions.)

References to Subjects and Queries.	Replies.
I. TOPOGRAPHY. II. CLIMATE.	*Vide* preceding report.
III. SANITARY CONDITION OF STATION.	1 to 13. For answers to these queries, *vide* preceding report. 14. Formerly cesspool privies were made, but they have been universally condemned, as they contaminate the wells and air in their proximity. The present system is that of surface privies with separate enclosed seats, with pans underneath, which are removed through holes in the rear wall, and emptied into conservancy carts, in which the contents are conveyed outside the station boundaries. The urinals drain into cesspools after being mixed with the refuse water of the washhouses. The system is very bad as it contaminates the soil. 15 to 24. *Vide* preceding report.
IV. HEALTH OF THE TROOPS.	1. The station, with the surrounding district, and the adjoining native population, are generally very healthy. 2. The diseases most prevalent among the natives are fevers, and bowel and liver complaints. In the city of Lahore, six miles off, small-pox and measles appear annually. 3. I attribute the healthiness of the neighbouring native population to the dry climate and almost entire freedom from malaria.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	4. The large force now at Mean Meer is constantly changing stations. Commanding and medical officers of corps consider that the health of their regiments improves in coming to this station. The various portions of the men's present accommodation are all equally healthy. 5. The troops at this station are always in barracks. 6. I have only seen a few invalids at Dhurmsala, but I have been at that place a good deal, and I dislike it very much for soldiers in the rains. Dalhousie, also in this division, is much drier, and I think would be a much more healthy station for troops. I think that Holta in the Kangra valley, where the Government tea gardens are, is the most fitting place for soldiers that I have seen in India, it being not too high, whereas I do not approve of very high elevations. 7. At first troops resident in hill stations are rather liable to attacks of febrile and other diseases on their return to the plains; but after this casual acclimatization has passed, a regiment remains healthier than one which has passed the hot season in the plains. 8. I most decidedly approve of selecting hill stations for troops. 9. Diarrhœa is the particular disease of hill stations, and with which troops are liable to be attacked on going to them. 10. The use of woollen clothing and flannel belts is absolutely necessary for the greater benefit to the health of men resident in hill stations. Better diet than what is usually provided in the hills should also be given to the troops, and during the months of April, May, and June exposure to the sun should be avoided. 11. The best season for a residence in hill stations is decidedly during the hot weather in the plains; but Europeans derive great benefit from a residence during winter in stations that are of moderate altitudes. The period of residence in the hills which would enable the men to obtain great benefit to their health could not be less than six months, or they would have to come from a cool to a hot climate. 12. Provided the troops keep their health in the hills, there can be no limit to the duration of such residence. 13. Avoidance of direct exposure to the sun and the precautions of ordinary common sense alone appear necessary for protecting the health of troops on their leaving hill stations for the plains. 14. A regiment should occasionally go to a hill station for a hot season; but a long residence in the hills would be very wearisome to men, affect their spirits, and consequently their health. Troops and convalescents should be moved every two years when stationed in the plains. 15. Additional accommodation at hill stations is being furnished for troops; but I cannot state whether the barrack and hospital accommodation in the hills or sanitaria generally is sufficient for the health and comfort of the men. 16. I consider an elevation of from 5,000 to 7,000 feet above the level of the sea as best suited for sites for hill stations. 17. There is no higher ground near Mean Meer which could be advantageously occupied as a hill station. 18. From experience I find that a sandy soil is good for the formation of a station, while a wet clay soil is bad, more particularly as the drainage is neglected. 19. I consider from 20 to 23 years the best age at which soldiers should proceed to India, and November the most fitting month for them to land therein. Troops, on first landing in India, are sent to depôts and put into barracks, carefully clothed and drilled, and then sent to their corps, generally speaking by steamers and bullock-carts, as opportunities may offer. For preserving the health of recruits on first landing in this country, I would recommend that they be kept from drink and undue exposure to the sun, and that healthy recreation be afforded them. 20. Troops destined for India should be sent here direct from the home depôts, if it be arranged for them to land here in November. If landed in this month, and at once marched off up country, the exercise and air would be the best way of giving them strength, and inuring them to the climate. 21. Troops are transported from Calcutta and Kurrachee by river steamers to Allahabad and Mooltan; thence, if in small parties, by bullock-carts travelling for 18 out of the 24 hours; but if in large parties, by regular marches of 12 miles a day on an average. 22. Both for physical and moral reasons, I consider that the number of years a British soldier should be made to serve in India ought to be limited to ten. 23. The manner of conducting medical boards as regards invaliding, whether at stations or at the presidencies, is believed to be satisfactory, and of such a nature as to avoid conflict of opinion. 24. Invalids destined for home should leave India during the month of January, so as to arrive in England about the beginning of May.
Diseases.	1. In each European regiment at this station there are regular surgeons' inspections once a week for the discovery of incipient disease. 2. Scorbutus is not a disease of this state, but when occurring, it is attributable to bad food, want of vegetables, hard work, and bad spirits. 3. The proportion of cases of hepatic disease usually under treatment is 3·86 per cent. I attribute this disease to the following causes, viz.,—heat of climate, exposure to the sun, and changes at night. Hard drinkers are predisposed to it. As a prophylactic measure which, in my opinion, would diminish its frequency, I would recommend that spirits be stopped and the men kept from exposing themselves to the rays of the sun. 4. Dracunculus is a disease unknown at this station. 5. The proportion which the constantly sick in hospital from venereal diseases bear to the total sick from all other diseases, is 1 in every 13. There is an experimental lock hospital here, which diminishes the severity of the disease without actually affecting the number of cases. It is considered very advantageous, but there is a difficulty in a large Indian cantonment with regard to supervision. It has been constantly tried in India, but the Government has not yet sanctioned a permanent establishment of the kind.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	6. The following are the diseases from which the troops at this station suffer, viz.:— *Fevers.*—Common, continued; intermittent, of the various kinds; and remittent. *Dysentery.*—Acute, chronic, and hæmorrhagic. *Cholera* only rarely, at very long intervals. On the last occasion, in 1856, it was extremely severe. *Small-pox.*—Common in a mild form, and to a limited extent. *Rheumatism* very common, but not in the acute form. The following table shows the proportions which admissions and deaths from the above diseases bear to the total admissions and deaths:—

Diseases.	Admissions to Total Admissions.	Deaths to Total Deaths.
Fevers -	1 to 3	1 to 4·5
Dysentery -	1 to 27	1 to 3·6
Cholera -	Nil.	Nil.
Small-pox -	1 to 322	1 to 32
Rheumatism	1 to 32	1 to 10

7. The character of fever is common ague, with enlargement of the spleen. Occasionally it is ardent remittent, the result of heat, and also the bilious remittent. Dysentery is of the acute kind. Small-pox is attended by weakness and imperfect elimination. Rheumatism is muscular and arthritic. These diseases are most prevalent during the months of April, May, and June, and again in September and October. They generally make their appearance at the setting in of the hot season, and the atmospheric changes, heat and dampness, and the drying up of inundations in September and October. These diseases do not arise in this cantonment from want of cleanliness or proper drainage, or from imperfect ventilation and water supply. Idleness among Europeans predisposes to disease, and want of proper food and clothing among the natives.

8. The prevalence of epidemic disease amongst the troops is partly owing to idleness in barracks, and on the march and in the field to certain deprivations of food and proper places for sleeping, and to other unavoidable circumstances.

9. Small doses of quinine have been tried with success as a prophylactic against malarial disease at this station.

10. The greatest care is taken of the troops at this station as to their accommodation and food, and no particular improvements, beyond those already stated, can be suggested towards the prevention or mitigation of epidemic disease.

V. INTEMPERANCE.

1. The soldiers at this station are usually temperate. The number of confirmed drunkards among them is very few, so few indeed that the proportion cannot be stated.

2. During the year from the 1st of April 1859 to the 31st of March 1860, in a troop of Bengal horse artillery, 115 strong, the total number of cases treated were 151, and there was but one case of delirium tremens. In a regiment of Bengal light cavalry, 348 strong, 1,139 cases treated, and four cases of delirium tremens. In a wing of an English regiment of royal infantry, 556 strong, 1,532 were treated, one case of delirium tremens. In a Scotch regiment of royal infantry, 955 strong, 1,493 cases treated, with 11 cases of delirium tremens. There are no data at this station to enable me to prepare a statistical table, showing the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime here. Drunkenness is always punished as an offence.

3. Rum is sold at the canteens, and native liquors in the bazaar; but this latter is not allowed to be sold to the soldiers. The quality of the spirit is bad. Not more than an average of one dram per diem is consumed by each man. Spirit does not form a part of the soldiers' ration either in barracks, on the march, or in the field. Formerly old soldiers used to take a morning dram, and they would do so now, but it is not permitted by commanding officers of corps. Wine and beer are commonly given as a ration to convalescents, brandy very rarely, but rum never. With regard to the brandy, the quality is fair. The amount is specially prescribed in every cases by the medical officer. No drinks injurious to health, other than intoxicating drinks, are sold at the canteen or bazaar at this station.

4. The consumption of spirits by troops and convalescents is injurious to health, and not at all conducive to the efficiency or internal discipline of the corps.

5. The restriction or abolition of the sale of spirits in the canteens and bazaars would be beneficial to the health of troops.

6. Malt liquors are considered preferable to spirits for troops. Wines are never used except in the hospitals.

7. There are regimental coffee shops at this station, and they are much frequented. Coffee, &c., and malt liquors at their proper times, are considered good for the health, efficiency, and discipline of the troops.

8, 9. It would be beneficial to the health of troops to suppress the use of spirituous liquors, and to substitute beer, tea, &c., but there would be an objection to carrying this out in a Scotch regiment.

10. The general establishment of coffee shops throughout the whole army would be very beneficial.

11. Extracts from the Bengal Military Canteen and Bazaar Regulations:—"Every means are "to be adopted to induce the soldier to give a preference to malt liquor, rather than to "spirits."

"The quantity of malt liquor so supplied is not to exceed one quart per diem per man.

"The allowance of malt liquor may be issued for consumption with the dinner.

"Canteens are to be opened in the hot season, or from the 1st of April to the 1st of November, from gun-fire until 10 a.m., and again from 5 p.m. until watch setting, and during the cold season, or from the 1st of November to the 1st of April, from gun-fire until 12 o'clock, and again from 4 p.m. until watch setting."

N.B.—It is the duty of the canteen committee to give orders for wine, ginger beer, spirits, &c., and to see to their quality. "No spirituous liquor, wine, or beer is on any account to be "sold or issued from the canteen, directly or indirectly, to any native whatever, nor are any

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	" of these articles to be allowed to be taken away from the canteen except on special " occasions, when the soldier requiring them for himself or family must produce an order " signed by the officer commanding his troop or company." " The canteen serjeant is held responsible that the canteen is always kept clean, and properly " ventilated, and regularly lighted from dark until closed for the night." " No spirits are to be issued on any occasion before the usual dinner hour, nor is any man to " be allowed more than 2 drams per diem, and these 2 drams are never to be issued at the " same time." " Men who draw malt liquors are only to be permitted to receive 1 dram of spirits in addition."
VI. Diet. VII. Dress, Accoutrements, and Duties. VIII. Instruction and Recreation. IX. Military Prisons. X. Field Service. XI. Statistics of Sickness and Mortality. XII. Hospitals.	For information under either of these heads, *vide* preceding report

(Signed) C. A. Windham, Major-General,
Commanding the Station and also the Division.
T. Black, Captain,
Executive Engineer.

17th November 1860.

JHANSI.

Accommodation:
- Queen's Troops: Artillery - 1 Company Bengal Artillery. Infantry - Head Quarter Wing.
- Native Troops: Artillery - Eurasian and Christian Company. Cavalry - 1 Regiment Irregular Cavalry. Infantry - 1 Regiment Sikh Irregular Infantry.

References to Subjects and Queries.	Replies.
I. Topography.	1. The aspect of the country surrounding the station is rocky, hilly, and barren. Ravines exist; but there is not much water, jungle, or wood in the immediate vicinity. 2, 3. The elevation of the station is about 700 feet above the level of the sea; but in the direction of Seepree, about 70 miles due west, there is a gradual ascent up to 2,000 feet above the sea. There is no higher or healthier ground near the station. 4. The river Betwa, six miles south-east, and Luchmee Tal, about a mile and a half north, are the nearest waters to the station. There are no marshes, and the vicinity of the station is not liable to overflow. There are many ravines, but they form a natural drainage, and are conducive to health rather than otherwise. 5. The station is open in every direction, and there is no obstruction to free ventilation. The soil being rocky and gravelly, with a substratum of quartz and granite, heat is retained and thrown out to a much later hour after sunset than if the soil were earthy. The prevailing wind is from the north-west. 6. At some distance from the station the country is cultivated. The nearest work of irrigation is the Kockaboor dawk, about three miles off. Neither rice nor indigo is cultivated, nor the preparation of hemp or flax carried on near the station. 7. The town of Jhansi is about one mile from the station, that of Oorcha about eight miles south-east by south, and that of Dultea about 17 miles distant north-west by north. 8. The station of Jhansi, with its vicinity, is rocky and barren, but as it stretches away, grass lands and soil fit for cultivation appear. The ground occupied by the station is partly new. 9. In sinking wells, water is usually found at a depth of from 40 to 50 feet below the surface of the earth. This is a very expensive process, as the wells have to be sunk through the solid rock. 10. Water does not lie on the surface, neither is there any drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived from wells, but is not stored. The Luchmee tank has always abundance of water, varying in quantity with the season. The water chesnut is cultivated, the water lily grows spontaneously, and inferior kinds of fish and tortoises are contained in the water. Tanks are not used for drinking purposes, and the sunk wells are carefully preserved from all chance of pollution. No nuisance or malaria proceeds from the tanks, as the prevailing wind carries any vapours that might arise clear of the station. 12. The supply of drinking water is sufficient, and can be increased by sinking other wells. The water is hard, slightly impregnated, agreeable to the taste, and of good quality. It is distributed for the purposes of cultivation by the Persian wheel. 13. Embracing all the topographical points, even including the heat occasioned by the rocky character of the soil, the station should be healthy. 14. Boards for the selection of sites are so inaugurated by the regulations that if their duties were carried out with ability and diligence, no improvement need be suggested.

JHANSI.
BENGAL.

References to Subjects and Queries.	Replies.
II. CLIMATE.	1. The instruments for conducting meteorological observations are rain gauges, thermometers, and pluviometer. 2. The following observations are from the Journal of the Asiatic Society, No. 5 of 1852. All other records were destroyed during the mutiny and new research is in its infancy.

Table of Meteorological Observation during the year 1851.

Months.	Mean Temperature.	Months.	Mean Temperature.	Months.	Mean Temperature.
January	—	May	96·2	September	81·1
February	—	June	94·4	October	85·1
March	80·8	July	—	November	73·6
April	88·6	August	—	December	65·7

3. The climate is healthy and bracing except during the hotter months of the year, perhaps less prejudicial and relaxing to a healthy subject than most parts of India. The station has not as yet had a fair trial, as the troops that have hitherto arrived have suffered from severe service and exposure. The cold season is the most healthy at this station. Intermittent fever prevails during the months of August and September.
4. There is no district near the station with a climate more conducive to health than that of Jhansi.
5. I have served in almost every Indian station, and regarding their salubrity, there is little choice, they are all equally relaxing during certain months. Dacca and Dinapore are most frequently visited by cholera. From this list I of course exclude the whole of the Punjab, as this has during eight months of the year a climate equal to the best. (Colonel W. W. Davidson.)

III. SANITARY CONDITION OF STATION.

1, 2, 3. Map of station, &c., forwarded.
4. Table of barrack accommodation.

Barrack Rooms or Huts.	Regulation Number of Men in each Room.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
INFANTRY.												
8½ Co. barracks:—												
2 rooms	24	67	22	28	41,172	1,715·5	61·4	1′ 9″	12	2	4	
4 rooms	2	18	11	14	2,772	1,386	99·0	1′ 9″	13	8	4	
									1	11½	8	
Mess rooms	48	46	25	28	32,200	—	—	—	2	8	4	
									2	5	3	
ARTILLERY.												
8½ Co. iron-frame barracks:—												
1 room	24	40	39	18	28,080	1,170	65·0	1′ 9″	22	10	4½	
1 room	24	39	39	16	24,336	1,014	63·3	1′ 9″	4	5	3	
1 mess room	—	39	25	18	17,550	—	—	—	4	9	5	
2 non-commissioned officers' rooms	—	19	12½	14	3,325	—	—	—	2	12	8	Open ventilators along the whole ridge of the roof.
3 verandah rooms	—	10	10	10	1,000	—	—	—	3	8	4	
									6	5	3	
3 pendals (temporary)	60	160	40	14	89,600	1,493	106·6	—	(Open all round.)			
1 thatched hut	25	90	30	14	—	—	—	—	—	—	—	
1½ Co. iron-frame barrack	As above, erecting for infantry in the Fort.											
Guard room	Not erected.											
Prison cells	Not erected.											

5. There are doors on both sides of the barracks in two leaves opening inwards, and verandahs on both sides, 160 feet by 12, which are usually in the hot season, and temporarily when the barracks are overcrowded, occupied by the soldiers as sleeping quarters. There are no jalousies or jhilmils.
6. The cots used for sleeping in the barracks are 6 feet 6 inches long, 2 feet 6 inches broad, and 2 feet high, covered with broad tape. Improvement is desirable, and could be effected by putting the head bar above and foot bar below the sides, thus giving a slight slope.
7. No reply to this query.
8. There are ventilating windows on both sides above the doors opening inwards, and generally speaking these means are sufficient to keep the air pure by night as well as by day. Punkahs are used and tatties during the hot winds.
9. No reply to this question.
10. The floors are usually of lime plaster 3 feet above the ground; stone slabs are preferable. There is no passage for air beneath the floors.
11. The barracks are well suited to this locality; but in damp situations two stories are preferable, the upper one only being occupied by troops. The barracks are repaired by the barrack department, except when large repairs have to be made, when the executive engineer does them. They are cleansed and limewashed as often as the medical officer may require.
12, 13. The men's lavatories and barrack cook-houses are not yet finished. The washing is done by dhobies.
14. The privies, urinals, &c., are on the standard plan for a company of infantry.
15. These buildings are ventilated at the top by openings that cannot be closed, and lighted from the side doors. The barracks are lighted at night by lanterns.
16. Drainage of the barracks entirely superficial. Sewage is collected directly in small open tanks close to the buildings, which are emptied and cleaned every day. These means are sufficient for the purpose. No part of the barracks or hospital is subject to dampness. The natural drainage is so good as to prevent any accumulation of surface water. The cesspits or tanks are only about three feet cube, and are cleansed morning and evening. There are no foul ditches near the station.
17. Surface cleansing is done by the barrack department. The refuse is removed in carts outside the limits of cantonments.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	18. The surface of the cantonment is kept free of vegetation. A few old buildings exist; but not in a position to affect the ventilation of the station. 19. The bazaar is new and incomplete, but is well-drained, and the arrangements as to cleanliness satisfactory. Public latrines are constructed at the expense of the bazaar residents. The police force is at present insufficient. There are no native houses, except in the Sudder bazaar, and no nuisance is experienced in barracks from wind blowing over them. 20. The slaughtering of animals for the use of troops is forbidden within the limits of cantonments, and is done outside and to leeward of prevailing winds. The offal should be burnt, but is quickly disposed of by vultures, adjutant birds, &c. 21. Bazaar horses are picketed in rear of the bazaar, and are under the inspection and control of the bazaar authorities. The manure is removed for fuel by the poorer classes. 22. There are no cavalry or artillery stables at this station. The conservancy carts remove the manure daily. The picketing grounds are upwards of 150 yards from the barracks, and to leeward of them. 23. There are no quarters for married non-commissioned officers and men. The pendals are occupied by married people as a temporary arrangement.
Officers' Quarters.	1. The officers' quarters here are inconvenient and ill-adapted for the purpose, being mere outhouses. Officers should be encouraged to build for themselves, receiving assistance from Government.
IV. Health of the Troops.	1. The station and surrounding district are generally healthy. 2. Fevers and venereal are the most prevalent diseases amongst the native population. Small-pox occasionally occurs, but cholera is almost unknown. 3. I attribute predisposition to disease among the native population to intense heat, the radiation from the rocky soil and brackish water. 4. H.M.'s 89th regiment was at Seeonee nine months, and left on the 27th of February 1860. The health of the men there was good: intermittent fever was the prevailing disease among them. They arrived here (Jhansi) on the 13th March, in a healthy condition; the prevailing disease since which time has been intermittent fever. No portion of the men's present accommodation is more unhealthy than the rest. 5. Most of the troops were in camp last year, the barracks not being ready for occupation. They suffered much during the hot season and rains. 6, 7. I have never served at hill stations, but I should say that troops that have been some time resident at them are, generally speaking, less liable to attacks of febrile and other diseases on return to service in the plains. 8. I approve of selecting hill stations for troops, as I believe them to be highly beneficial to health 9 to 12. The regiment has never been in a hill station. 13. I would recommend the use of flannel under-clothing as a precaution for preserving the health of troops leaving hill stations for the plains. 14. I should say it would be most conducive to the preservation of the health of troops serving in India to locate them on hill stations, with short periods of service in the plains. Frequent change of stations in the plains is beneficial to the health and spirits of troops and convalescents. 15, 16. I have no experience to enable me to answer these questions. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. A sandy surface, with a gravelly subsoil, is the most healthy for a station. 19. Troops should not be sent out to India under 20 years of age, and should land there in November. Troops on landing in India are usually sent to their regiments, and are some time on the march. Before proceeding up country they are provided with such clothing as they require. I would recommend as a precaution for the preservation of the health of troops on first landing in India, that they be kept as far as possible from exposure to the sun and from intemperance. 20. Troops destined for India should, in the first place, be sent to an intermediate station, and then on landing in India should be sent to hill districts. 21. Troops are forwarded from the port to the interior by steamer or thatched bunder boats, if by water; by railway or bullock train if by land. 22. British troops should not serve more than from six to ten years in India. 23. Medical boards are conducted in such a manner as regards invaliding as to avoid conflict of opinion. 24. Invalids should leave India for home about the end of January.
Diseases.	1. Among European troops an inspection for the discovery of incipient diseases takes place weekly at this station. 2. There have been very few cases of scorbutic disease in the 92nd regiment, and none at all in the 89th. As a preventive measure against this disease, I would recommend a greater variety in and an increased quantity of vegetables. Potatoes should invariably form portion of the daily ration. 3. The proportion of cases of hepatic disease is usually about 1 in 15, and the probable cause the effect of the climate. It is not consequent on other diseases. 4. No particulars are as yet known here of the disease called dracunculus. 5. The regiment having been on field service since its arrival in India, venereal disease has not been prevalent. 6. The prevailing diseases here are intermittent fever and a few cases of dysentery, but no cases have occurred of cholera, small-pox, or rheumatism. Having only lately arrived here, I cannot state the proportion which is borne by admissions and deaths from these diseases to the total admissions and deaths. No death has yet occurred from fever. 7. There has been no epidemic disease here since the arrival of the regiment. The station is well situated; the bazaar and native dwellings clean and well-drained, with a good supply of water, and they are not crowded. 8. The regiment has not suffered from any epidemic disease since its arrival in India. 9, 10. Small doses of quinine have not been given here as a prophylactic against malarial diseases. I have no recommendations to make on any of the preceding points.
V. Intemperance.	1. The soldiers at this station are temperate, and there are no confirmed drunkards among them. 2. There are no admissions into hospital from diseases arising, either directly or indirectly, from intemperance. Drunkenness is always punished as an offence. 3. Distilled spirit is sold at the canteen, but never forms part of the ration to convalescents,

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	nor of troops, either at the station, on march, or in the field. No drinks injurious to health, other than intoxicating drinks, are sold at the canteen or bazaar. 4. Although the use of spirits by troops or convalescents is not injurious in moderation, yet it is not conducive to health. In moderation it does not affect the internal discipline of the corps. 5. The use of spirituous liquors should be restricted, but could not be abolished. 6. Malt liquor and wines are beneficial to health, being tonics, whereas spirituous liquors are merely temporary stimulants. 7. Neither coffee, tea, lemonade, nor soda-water is much used at this station. 8, 9. Beer might be substituted with advantage and by degrees for spirits. It would not be beneficial at once to prohibit the sale of spirituous liquors in the canteens, as then men who were accustomed to it would take to country liquor, which is more injurious. 10. I would suggest as an improvement on the above points a more liberal supply of malt liquor. 11. No reply to this query.
VI. DIET.	1. The daily scale of rations for Queen's British troops and European troops in the Indian army is the same, and as follows:—Meat, 1 lb.; bread, 1 lb.; rice, 4 oz.; salt, 1 oz.; sugar, 2½ oz.; tea, ⅘ oz. (⅘ black, ⅕ green); milk, 6 oz., and vegetables, 1 lb. There is a responsible inspection every day of the rations by the captain and subaltern of the day, with the quartermaster, and when in doubt, a medical officer. 2. One pound of vegetables a day such as are procurable at this station during and after the monsoon is not sufficient for the men. The men here have three meals daily, viz., breakfast at 8 a.m., dinner at 1 p.m., and the evening meal at 5 p.m.; the first and last consisting of bread and tea. 3. As an improvement in this ration, I would suggest that potatoes invariably form part of it, with other vegetables in as great a variety as possible. The rations of each company are cooked together by native cooks. 4. The cooking apparatus admits of the ration being boiled only; but kitchens are being built. The cooking is not sufficiently varied. Good tea is properly prepared for the men, and when on the march some of them get coffee. 5. Gardens for the cultivation of vegetables by the soldiers could be advantageously established near the station.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. In the hot weather khakee clothing and wicker helmets are worn by the troops at this station, and in the winter the usual regimental clothing. The ordinary accoutrements are worn. I consider the present dress as suitable to the climate, and for the soldier's duties by day and by night and at different seasons. I would recommend the use of flannel underclothing in all seasons here. The guard-dress at this station consists of khakee clothing in summer, and warm regimental clothing with great coat in the cold season.
Duties.	1. Troops should be thoroughly drilled at home, or at some intermediate station, before being sent to India. 2. There are parades in the morning and evening here, and the men do not appear to suffer in health from the drill. The best time for drills, parades, or marches is the early morning. The men have, on an average, about 8 nights in bed. 3. There are regimental guards only at this station, so that they are quite close to the barracks. There are roll-calls day and night at uncertain hours. The men do not appear to suffer from the usual night guards.
VIII. INSTRUCTION AND RECREATION.	1. The following are the only means of recreation and instruction provided at this station:—School with good schoolmaster, library, reading and day room, one garden for the soldiers, but there are no funds for its proper maintenance, and workshops. There are no ball courts, theatres, gymnasia, or skittle grounds, but these last have been sanctioned, and will be provided as soon as the barracks are completed. These means are not sufficient to keep the men occupied during the heat of the day and in the wet season. During the hot season the men are not allowed to leave their barracks during the heat of the day from 8 a.m. to 5 p.m.,—a measure attended with marked benefit. 2. To increase the efficiency of the present means of recreation and employment, ball courts, roofed skittle grounds, gardens, swimming baths, &c., are strongly recommended. 3. Soldiers' savings banks exist here, and are found advantageous. 4. Verandahs only, for shade.
XI. MILITARY PRISONS.	1. There are no military prisons at Jhansi.
X. FIELD SERVICE.	1, 2. No replies to these queries. 3. The principal medical officer and engineer are on the sanitary committee, and their suggestions would be followed with respect to general sanitary regulations. 4. No reply to this query.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head is transmitted.
XII. HOSPITALS.	1 to 15. The hospitals are not yet built, but barrack No. 2 is used as a temporary hospital. 16. For copies of diet tables, diet rolls, &c., *vide* the New Hospital Regulations. 17. There are a hospital serjeant and native orderlies for attendance on the sick, but neither matrons nor European orderlies are allowed in the Bengal Presidency. European female nurses would be of the greatest advantage to the sick women and children. 18. No epidemic disease has as yet appeared here. 19. No reply to this question. 20. There are no shady walks or seats for convalescents. 21. There is no female hospital as yet erected. 22. No answer to this query. 23. All suggestions of the medical officer as regards the sanitary state of his hospital, repairs to buildings, change of diet, &c. would be attended to. 24. There is no hospital or ward for convalescents at this station, but such accommodation would be an advantage.
XIII. BURIAL OF THE DEAD.	1, 2. The burial ground for British troops is about 1,800 yards from the European lines directly to leeward, and is about 350 yards square. Its soil is alluvial, about 10 feet deep, with a subsoil of rock, and it is drained into a nullah, forming one side of the ground. The ground has only recently been laid out. 3. The graves are about 7 feet 4 inches by 7 feet deep, with intervals of 5 or 6 feet between each. The graves are never re-opened, and as soon as the burial ground is full it is enlarged. Interment always takes place within 24 hours, but this is not compulsory.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead. —*cont.*	4. The graveyard is never offensive. The men are buried either morning or evening. 5. The dead of camp followers and bazaar people are disposed of in like manner as with the native troops. 6. Injury must in many cases accrue to the public through the present practices, but the cause is not always traced home. 7. The burial ground should be enclosed and interments prohibited elsewhere. Some system of registration of deaths should be enforced, as the death and interment constantly take place before the bazaar authorities are aware of the former.

(Signed) *Henry H. Maxwell, Lieut.-Col., Commanding at Jhansi.
R. Gilborne, Surgeon, 89th Regiment
John Baillie Captain, Ex. Engineer

24th April 1860.

* I have signed my name above as being at present in command.; but as I have only been in that command for two days, I have had nothing to say to answering the questions. I coincide, however, in the remiarks herein entered.
Henry H. Maxwell, Lieut.-Col., Commanding at Jhansi.

MORAR GWALIOR.

Accommodation:
- Queen's Troops: Artillery - - Two Batteries.
- Queen's Troops: Infantry - - Twelve Companies.
- Native Troops: Cavalry - - One Regiment.
- Native Troops: Infantry - - Two Regiments.

References to Subjects and Queries.	Replies.
I. Topography.	1. The cantonment of Morar is situated in a species of basin surrounded by stony, barren hills of small elevation, at distances of from 3 to 6 miles. These hills are covered with a coarse grass and thorny jungle, and there appears to be a good deal of iron in the soil of which they are composed. The vicinity of the station is an open undulating country, intersected by small ravines running into the Morar Nuddee, on the east bank of which the station is built. There is a good deal of cultivation to the west of the station, but none on the other side, except at a considerable distance off. There is no wood or jungle in the immediate neighbourhood. There is a jheel out on the north-east flank, but some miles away from the cantonment. The bed of the Morar river is gravelly, and contains pure running water the whole year round. 2. The elevation of the station above the sea is about 800 feet, but it is on a level with the adjacent country generally. It is about 35 feet above the bed of the river Morar, on the bank of which the station is built. There is a higher table land to the east—probably 30 or 40 feet more elevated—but, on military grounds, it could not be made use of without virtually abandoning the present cantonment, on which a large outlay has been incurred. 3. The only extensive table land in the vicinity is the Kolait plateau, about 10 or 12 miles to the westward of the present station, with an increased elevation of from 300 to 400 feet. 4. The nearest water is the Morar Nuddee, on the bank of which the station is built. The vicinity is never liable to overflow from this river. During the rains, however, one of its small feeders which runs along the east of the station overflows its banks, but this only lasts for a few hours. There are several ravines near the station which have been a good deal used by the natives for the calls of nature, and consequently emit a bad effluvia, especially after rains; otherwise I do not think the ravines would be the cause of sickness. 5. There is great room for improvement, such as clearing away trees, otherwise the station is open and fairly exposed to the prevailing winds. The temperature is generally cooler a short distance from the station than within the station itself. The station is freely exposed to all winds, which are very variable and at certain seasons cold. The prevailing and most healthy breeze is from the west, and comes straight from the sea, which is distant, however, about 800 miles. Easterly and variable winds increase the admissions into hospital from bowel complaints, rheumatisms, and fevers. 6. The surrounding country is but sparingly cultivated, and there are no works of irrigation near the station, nor is there any artificial irrigation affecting the health of the troops. The cultivation of rice is prohibited within the bounds of the cantonment, and no cultivation of indigo or preparation of hemp or flax is carried on in the vicinity. 7. The old town of Gwalior is about 2½ miles from the station, and the Lushcar is about the same distance. They both lie to the westward. 8. The surface of the district is argillaceous, resting generally on strata of kunkur, varying in thickness and density. The station occupies ground on which were originally two or three villages and some cultivation. 9. Water is found during the dry season about 35 feet below the surface, and during the rains at a depth of about 30 feet. 10. The surface drainage flows readily away, and there is very little percolation into the subsoil of the station from the adjacent higher ground. 11. The water for drinking is obtained from wells, the natives using the water from the Morar Nuddee for cooking purposes. No tanks of any kind exist for the storage of water. 12. There is an ample supply of well water for the station, which appears generally very pure, colourless, and sweet. It is soft, abundant, and excellent, but has not been examined chemically or microscopically. It is drawn, for the troops, in the usual way by bheesties with leathern buckets, carried away in leathern mussucks, and stored in baked earthen vessels. No better water supply could be obtained. 13. No reply to this query. 14. Sites of new stations are always selected by committees, generally composed of the chief civil, military, and medical authorities, and the executive engineer. The amount of inquiry as to the points referred to is generally very limited, more heed being paid to appearances than anything else. Stations are generally selected on account of the extent of ground required; and the necessity for their speedy selection is generally so emergent, that no time is ever allowed for proper inquiry into the nature of the surface-soil and substrata, or for a determination of cross levels, both with a view to proper drainage or relative altitude. These points should be more strictly attended to than they hitherto have been.

MORAR GWALIOR. BENGAL.

References to Subjects and Queries.	REPLIES.
II. CLIMATE.	1. There has never been a barometer at the station, but a common and wet bulb thermometer and a pluviometer were available. 2. The following meteorological table is for less than two years, comprising the time since Gwalior was re-occupied, in June 1858.

ONE YEAR OF OBSERVATION.—From January 1859 to December 1859.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Days of Sunshine.	Remarks as to Clouds, Dew, Wind, Storms, &c.
January	No instrument.	68°·5	8°·0	76°·0	62°·0	27	1 storm.
February		74·0	18·5	87·0	60·5	19	2 storms.
March		77·5	13·4	88·5	68·5	30	None.
April		81·5	14·5	99·0	76·0	24	4 storms.
May		95·5	11·0	105·0	86·0	25	3 storms.
June		96·0	12·3	105·5	85·0	14	8 storms.
July		95·0	11·0	106·0	83·5	16	1 storm.
August		85·0	5·2	89·0	80·5	16	1 storm.
September		89·0	3·3	93·0	83·0	24	None.
October		84·5	7·3	90·5	80·5	31	None.
November		78·0	No register kept.			—	—
December		61·5	11·5	70·5	56·5	31	None.

3. The climate is dry and hot, but is salubrious. There has been no irrigation nor tree planting since June 1858, but well-grown trees are superabundant, and require thinning. The air is often loaded with dust; no prejudicial effects, however, have been traced from it; every one, very properly, avoiding these dust storms. The troops have enjoyed a very fair share of health, considering the disadvantages they have had to contend with as regards barrack and hospital accommodation, &c. The shelter has been, and even yet is, indifferent and limited. The diets are now good as regards animal food and bread, but potatoes have not been furnished so regularly as could be wished. The men have now warm clothing for the cold season, and light loose clothing for the hot weather, and the drills, duties, and exercises are adapted to the different seasons of the year. The most healthy season is the termination of the cold and commencement of the hot weather. The most unhealthy period is the end of the hot and wet seasons. Head affections, bowel complaints, and fever prevail in May and June; fevers and bowel complaints after the rains.

4. There is no district near the station, the climate of which is more conducive to health than that of the station itself, but there is a ridge running north and south about three-quarters of a mile from the present camp, which in regard to elevation, natural drainage, &c. &c., seems a far more eligible site for a station than Morar, and I cannot comprehend why it was not selected in preference.

III. SANITARY CONDITION OF STATION.

1. No plan of the station and adjacent country exists, as no topographical survey has yet been made; but a plan of the station itself, showing the position of the buildings, &c., has been forwarded.

Date of construction of barrack 1859–60.

Barrack Rooms or Huts.	Regulation Number of Men in each Barrack.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man sleeping	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows in each Barrack. Number.	Height.	Width.	Remarks.
		Ft.	Ft.	Ft.			Ft.	Ft. In.		Ft.	Ft.	
Fort barrack No. 1 — 2 wards, 1 mess room, 4 corner rooms	48 men 4 serjeants *In three,* 144 men	67 48 18	26 25 12	24 24 14	83,616 28,800 12,096	1,740 — —	73 — —	1 9 — —	28 10 12	2 2 5	4 4 4	One room in each barrack is used as a mess room, so that, if necessary, 16 men more could be accommodated.
Fort barracks Nos. 2, 5, and 6, as above	12 serjeants	Do.	Do.	Do.	Do.	Do.	Do.	Do.	Do.	Do.	Do.	In Nos. 1 and 2 there are central pillars in the wards, which take up some of the space shown.
Fort barracks Nos. 3 and 4 — 2 wards, 1 mess room, 4 corner rooms	*In two,* 120 men 12 serjeants	67 54 24	32 25 12	24 24 14	102,912 32,400 16,128	1,715 — —	71 — —	1 9 — —	28 10 12	2 2 5	4 4 4	
NEW CANTONMENT BARRACKS.												
No. 1 — 2 men's wards, 2 serjeants' wards, 1 mess room	48 men 4 serjeants 48	67 24 25	24 14 24	24 24 24	77,184 16,128 28,800	1,608 4,032 —	67 168 —	1 9 1 9 —	32 8 10	2 4 2	4 3 4	
Eleven more, precisely similar to the above No. 1	528 men 48 serjeants	—	—	—	—	—	—	—	—	—	—	
OLD BARRACKS.												
Double barrack No. 1 — 8 men's wards, 16 serjeant's wards, 2 spare	160 men 16 serjeants	72 14 9	24 10½ 10½	16 16 16	222,184 38,528 6,536	1,384½ 2,533 —	86 158 —	1 9 1 9 —	None.			There are central pillars also in this barrack.
Single-company barrack No. 2 — 4 men's wards, 8 serjeants' wards	80 men 8 serjeants	72 14	24 10½	15 16	111,092 19,264	1,382 2,533	86 158	1 9 1 9	None.			Do. Do. Do.
Ditto No. 3 — 5 wards	100 men 8 serjeants	79	26	15	154,050	1,400 1,755	93 117	1 9 1 9	None.			Do. Do. Do.
Ditto No. 4, precisely similar	100 men 8 serjeants	Do.	Do.	Do.	Do.	Do.	Do.	Do.	Do.			Do. Do. Do.
Ditto No. 5 — 6 men's wards, 1 serjeants' ward & corner rooms	90 men 8 serjeants	50 44	20 18	22 16	132,000 12,672	1,474 1,584	67 99	1 9 1 9	56	2	4	There are no centre pillars in this barrack, and the windows, as in the new barracks, are sky-lights near top of wall.
Ditto No. 6 — 3 men's wards and corner rooms (This barrack, however, has an improper aspect.)	48 men and 4 serjeants	63	18	18	61,452	1,280	71	1 9	30	1	2	Ventilation openings near top of walls.
Total	1,594 men and serjeants.											
Guard room	There are no guard rooms built as yet; the old buildings will be given up for such purposes as soon as the new barracks are ready.											
	There are no regular prison cells as yet built; those now in use give about 1,200 cubic feet per man, and the new ones will allow about 1,600 cubic feet per man.											

N.B.—The space enclosed in the part of roofs is not included in any of the above calculations.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	EXTRACT of a Letter No. 2,982, dated 23rd June 1860, addressed by the QUARTER-MASTER-GENERAL OF THE ARMY, Bengal Presidency, to the OFFICER COMMANDING GWALIOR DISTRICT, having reference to Questions not properly answered, on the Sanitary State of the Indian Army, for the Station of (Morar) Gwalior. *Question* 2. The position of the native latrines, as shown in the Trace Plan of Cantonments, is objectionable; they are to the west and windward of the proposed hospitals are they permanent? *Question* 3. According to the plan of the half-company barracks, the non-commissioned officers' end rooms are certainly not fit for occupation. The sloping roof should be continued over them, and projecting verandahs, with bath-rooms in the corner, should be provided. This will be brought to the notice of Government, but Brigadier McCausland should report on the subject with reference to all the stations in the district, and offer suggestions.—*Further answer*, vide *Annexure*. *Question* 4.—HEALTH OF THE TROOPS.—Some further explanation is required as to the selection of sites for barracks alluded to in the reply to the second clause of Query 4, p. 30.—*Further answer*, vide *Annexure*. A report should be furnished on the proposed improvements to the nullah in front of cantonments, mentioned in p. 58. *Question* 5.—HOSPITALS.—In the reply to Query 5, p. 59, it is said the hospital will be a one-story building, while the plan sent by Captain Basevi shows it to be of two stories. (True extract.) F. S. ROBERTS, Major, D.A. Quartermaster-General of the Army. No. 640 of 1860. From Brigadier J. K. McCAUSLAND, C.B., Commanding Gwalior District, to the QUARTER-MASTER-GENERAL OF THE ARMY, Simla. SIR, Morar, 10th July 1860. IN reply to your "Memorandum," No. 2,982, of the 23rd June, returning the Committee* replies to the Royal Sanitary Queries, I have the honour to state— *Question* 2.—SANITARY CONDITION OF STATION.—1st. Regarding the native latrines. They are in the only available spot in the cantonment to which the natives would resort, and their present position in no way interferes with the salubrity of the barracks or hospitals, being to the eastward of the former, and situated at least 20 feet below the level of the latter, and are at a distance of, I should say, 1,000 yards to the westward. They are kept perfectly clean, and can in no way affect any public building, and they may be removed at any time. *Question* 3.—2nd. The serjeants' rooms in the new barracks at Morar are under the chopper, and not, as in the fort, in the verandahs. This alteration was made since the Sanitary Report was drawn up. The executive engineer having received instructions to erect choppers over the serjeants' quarters in the fortress, this will correct the evil complained of there. The present site of the barracks in Morar was selected by Lord Clyde; the Committee recommended the high ground, and no doubt it is the best, but, in a military point of view, his Lordship set aside their recommendation, at least so I am informed. *Question* 4, *Clause* 2.—HEALTH OF THE TROOPS.—3rd. With regard to the nullah, I am of opinion that any attempt at improvement would make matters worse. Almost every drop of water that falls within the boundary of cantonments is carried off by this natural drainage into the Morar river; therefore to fill it up would be impossible; and if the present grassy slopes on both sides are touched, the force of water that now passes down would very soon make a deep ravine. Half an hour after the heaviest rain the nullah is perfectly dry, unless, perhaps, a few inches of water that may be left in one or two spots that are below the level; these are easily filled up, and will be so as discovered. Nothing can be cleaner kept than the bed of this nullah. Medical men are apt to cry out at nullahs passing through cantonments, but this one, in my opinion, is not of the description that causes sickness. *Question* 5.—HOSPITALS.—4th. In reply to concluding paragraph. At the time the sanitary report was submitted, it was intended the hospital should be one story; but since, the Secretary to Government, Public Works Department, having written to the Executive Engineer to suspend the building, as Government contemplated making an upper-storied one, it was thus the apparent discrepancy has taken place. I have not yet heard that the upper-storied hospital is actually sanctioned, but I have little doubt it will be so; I attach a plan of it to the sanitary report. I have the honour, &c. F. H. McCAUSLAND, Brigadier, Commanding Gwalior District. 5. There are no windows at all in the old barracks. In the new ones the windows are on opposite sides, and also at the ends. They open on the revolving principle, on a pivot at each side. There are verandahs 10 feet wide running round the whole of the old and new barracks. The height on the outside, in the old barracks, is 10 feet; those in the new ones are flat-roofed, and 14 feet interval height. These verandahs are not intended to be occupied as sleeping quarters. There are doors in the main walls, but no jalousies or jhilmils. 6. The bedstead used in the barracks is a frame of wood, laced over with twine, and the bedding consists of 1 cotton settringee, 1 cotton quilt, 1 blanket, and 2 cotton sheets. 7. The tents used in camp are made of four or five thicknesses of cotton, with two upper flies and wall 6 feet high; they are 24 feet by 14 feet, giving a cubic space of 3,000 feet, and have 16 men in each, at 21 feet superficial area per man. 8. The old barracks have small ventilations, pierced in a projecting plank of wood. These planks are about 4 long and 1 high, at intervals of 12 feet, running along near the ridge of the roof on both sides. In the new barracks there will be ample window ventilation, and, in addition, ventilating tubes can be inserted in the thatch near the ridge of the roof

* Returned by Dak Bunghey.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	on both sides. The ventilation of the old barracks is imperfect, but that of the new ones will be quite sufficient to ensure pure air by night as well as by day. There is no mechanical means employed of cooling the air in the barrack rooms other than by the use of kus-kus grass tatties or frames, which are placed in the doorways on the side of the prevailing winds, and then kept well watered. 9. The temporary barracks are constructed of stone or kutcha or burnt bricks and mud mortar, according to the resources of the locality. The roofs are generally tiled over grass fascines, or entirely thatched; the walls generally plastered and whitewashed, and the floors mud plastered. The permanent barracks are constructed of stone or burnt bricks and lime mortar, the roofs being tiled over grass fascines, or else entirely thatched. The floors are either beton plastered, burnt bricks on edge, or stone slabs, according to the resources of the locality. 10. The floors of the new barracks will be 4 feet above the level of the ground, and well rammed earth is to be filled in previous to laying the flooring. There is no free passage of air underneath. 11. The materials used in the construction of barracks, huts, and tents are quite suitable to the climate. Thatched barracks are generally cooler than others, whether tiled or flat-roofed. Where sufficiently raised, there does not appear to be much room for improvement in construction, though it might be considered that they would be drier and healthier if the floors, instead of being solid, were to rest on arches, by which means a free current of air could pass underneath; but, unless these arcades were sufficiently lofty to be easily visited and cleaned, they might serve as receptacles for refuse matter, vermin, &c. The barracks and cantonments are kept in repair by the executive engineer, but petty or urgent repairs are always executed at once on requisitions from the barrack-master. The barracks are whitewashed once a year. 12. Each company is supplied with a wash-house and privy under one roof. A certain number of tubs or large earthen vessels are allowed for holding the water for lavatory purposes, which is supplied by bheesties or water-carriers from the nearest well, as required; a certain number of earthen or metal washhand basins are also allowed. The drainage is received into a cesspool four or five feet in depth, at the bottom of which is laid about a foot of gravel or sand, any filth or refuse matter being carried away from the cesspool every morning in filth tubs. 13. Cooking recesses or chulas are provided of burnt bricks or stone, on which the native cooks are enabled to perform all the cooking required for the troops; there is a well close to every cook-room, from which the cooks either draw their own water, or have it supplied to them by each company's water-carriers. The filth and refuse from washing dishes, &c., is received into cesspools, and daily cleared away as noticed for wash-houses. The washing of linen is done entirely by native washermen; there is no arrangement for the purpose on the part of Government. 14. Every company is provided with a privy and urinal, the drainage from which is received into a cesspool, and carried off daily in filth tubs or carts. 15. These buildings are ventilated through the roofs. The new barrack will be lighted by oil lamps suspended from the roof. 16. The ground around all barracks is sloped off, so that no water shall lodge in the neighbourhood; open drains intersect the blocks of barracks, so as to lead off all surface drainage to the main channels, which convey the same to the nearest nullah or river. There is no drainage at Morar, except surface drainage from rain. The surface water and the drainage from washhouses, privies, urinals, and cookhouses is conveyed into cesspools, and from thence removed in carts. There is no proper sewerage, as the term is applied in England; but the drainage in Morar is ample, owing to the great cross-slope in the site. The cesspools which receive the drainage from out-offices attached to barracks are, on the average, three feet each way in breadth, and about five feet in depth; they are never less than 50 yards from the nearest well, and are quite sufficient for all purposes, being about 100 feet from the nearest quarters, and cleaned out daily. There are no foul ditches, properly so called; and the ravines, which might get foul, unless properly watched and attended to, are about 300 or 400 yards from the soldiers' barracks. 17. The surface cleansing within the cantonment and its vicinity is performed by means of a conservancy establishment of carts and sweepers, which is maintained under the orders of the barrack-master, whose duty it is to remove all refuse, filth, manure, &c., from the surface of the cantonment, cesspool, &c., and to carry it out to some distance, where it is either used as manure by the villagers, or else burnt. This duty has been efficiently done hitherto. 18. No rank or objectionable vegetation is allowed in the cantonment, and all hedges and trees are trimmed down so as to allow of a free circulation of air. There is a little room for improvement in the ventilation of the station by the removal of trees and old walls; but this will be effected as the new barracks approach completion. 19. The bazaar is well drained and ventilated; the water is supplied from wells. Latrines are constructed well out to the front, and not at all crowded. Five sweepers are kept for the purpose of general cleanliness; and the inhabitants are required to sweep their premises clean, and to place the sweepings in a bucket in front of their houses every evening, to be emptied in the rubbish-carts (of which there are three) as they pass. The bazaar serjeant reports on the state of the bazaar daily, and any one infringing these regulations, which answer very well, is punished by fine. No native buildings are allowed within the boundaries of the cantonment, thus avoiding any nuisance in barracks from wind blowing over the native dwellings. 20. The slaughter-house is to the east of the cantonments, about 1,000 yards from the barracks, and as it is not situated on the windward side no nuisance is experienced. All refuse is carted away to a distance. 21, 22. No horses are allowed in the lines. The station being at present in a transitory state, and numerous alterations in progress, the horses are picketed wherever room can be found, but always to the east of the barracks, and some distance to the front. 23. There are only temporary quarters for married soldiers, but they are entirely separated from the barracks occupied by the single men.
Officers' Quarters.	1. The officers' quarters are what were formerly private houses. No improvement can be suggested with regard to them, as the sanitary condition is satisfactory, and the drainage, ventilation, &c., appears to be ample.

References to Subjects and Queries.	Replies.
IV. Health of the Troops.	1, 2, 3. The station and district and native population are very healthy; there has been no epidemic disease since 1858. Spleen disease exists, but to no great extent, which is attributable to a dry climate and soil, and abundant and cheap food. 4. Previous to arriving at this station, the troops were mostly engaged in the field; some were recently from Europe, where they were healthy. In the hot season of 1858, when under canvass, they suffered much from sun-stroke and exhaustion, consequent on the fatigues of the campaign; they have since suffered from ordinary complaints, but in no extraordinary degree. The barrack accommodation is not yet good, but large barracks are in course of erection, when, no doubt, the men will be healthier; but the sites of these barracks have been all selected towards the bottom of the nullah, instead of towards its origin, more to the south, and where they could have been placed on higher ground, and at twice the distance from its dirty bed. 5. The 17th lancers were sent out of camp for change last cold season, but seemed to derive little improvement from it. 6, 7, 8. I have never been in charge of troops at a hill station, nor has my experience given me great confidence in hill climates for many of the diseases for which men require a change from Central India. This season I proposed to send several men to the sea-side, instead of to the hills, but it was not considered convenient; but in future years I am sure it will be found necessary to do so. For healthy regiments no doubt stations on the hills are desirable, as far as practicable. 9, 10, 11, 12. I have no experience with regard to any diseases peculiar to hill stations with which troops are liable to be attacked on going to them; but no doubt every precaution must be taken to provide proper shelter, clothing, &c. &c., to enable them to obtain greater benefit from residence at those stations. 13. Great precautions are required for protecting the health of the troops on leaving hill stations for the plains. 14. As a general rule, regiments should be located as much as practicable at hill stations, where certainly health can be preserved, though not always restored. Frequent changes of station in the plains are beneficial to the health and spirits of the men. 15, 16. As regards barrack and hospital accommodation at hill stations, and the ranges of elevation above the level of the sea which form the most suitable sites for such stations, I have no experience. 17. There is no higher ground in the district which could be advantageously occupied as a hill station. 18. With regard to the class of surface and subsoil for stations, I prefer a loose, sandy, absorbent soil. 19. Soldiers proceeding to India should be of mature age, and should arrive at the commencement of the cold season. Recruits, on landing, are furnished with cap covers and a suit of khakee, and sent to join their regiments without delay; they undergo much drill on joining, but perform no regimental duties until dismissed drill. With regard to length of marches, they are placed on a footing with long resident soldiers. They should land in India in November, be equipped with helmets at the place of debarkation, and should reach the head-quarters of their regiment in March, but no later. 20. A short residence (one or two years) at an intermediate temperate station would be beneficial to troops proceeding to India, and on landing they should be sent to the most healthy stations, and gradually acclimatized. 21. The modes of transporting troops from the port to the interior are,—by railroad, where available; by bullock train, resting at bungalow stations during the heat of the day; or by steamers on the Ganges, as far as Allahabad. These modes of transport are generally good. 22. The number of years a British soldier should serve in India is from seven to ten. Men landing in India with good constitutions, and from 18 to 22 years of age, may retain good health much longer, but those of more mature age, and naturally delicate, or with damaged constitutions, will succumb to a long residence in so debilitating a climate. 23. I have never known any conflict of opinion in medical boards as regards invaliding. 24. It is desirable that invalids should leave India in the spring, in order that they may reach home in the summer.
Diseases.	1. Inspection parades, for the discovery of incipient diseases, are held once a week. 2. Scorbutic disease does not prevail to any great extent at Gwalior; but in my late tour of inspection I found it at Jhansi and Lullutpore, and recommended potatoes and improved diet, it being chiefly attributable to the want of proper vegetable food. 3. The proportion of cases of hepatitis varies, but is not unusually prevalent here; the causes are a hot dry climate, a heating diet, with too great a proportion of animal food and ardent spirits, and the small proportion of vegetables. The prophylactic measures are malt liquor and potatoes, for the native vegetables are never relished by soldiers for a continuance; potatoes they never tire of. 4. Dracunculus is seldom seen at Gwalior. 5. The proportion of constantly sick from venereal disease to the total sick in hospital has been as high as 80 per cent., and is seldom under 12 or 20. Lock hospitals and a good conservative police should be established wherever there are European soldiers. 6. The troops at the station suffer from diseases of the endemic class, such as fevers, chiefly of the intermittent type, which are common at certain seasons, but the mortality is inconsiderable. Dysentery is always prevalent, though most frequent before and after the rains. Cholera and small-pox has never appeared. Rheumatic affections are met with in variable weather, with east winds. The proportion of fever admissions to total admissions is 38·64 per cent., and the proportion of dysentery admissions to total admissions 5·39 per cent. 7. The more frequent zymotic diseases are fevers of the intermittent class, and occasionally continued or remittent, and bowel complaints, which are most prevalent at the end of the hot season and beginning of cold weather. The atmospheric conditions which precede or accompany these diseases are variable, being hot and dry, or cold and damp. The station and bazaar are well drained, and the supply of clean water is abundant, but native houses are very apt to be crowded and ill-ventilated; however, disease has never prevailed to any extent. As regards any personal habits or conditions among the troops or native population predisposing to these diseases, I have nothing worth recording. 8, 9. Epidemic disease has never prevailed to any extent, nor has quinine been tried at this station as a prophylactic against malarial disease. 10. I have no recommendations to make as to the prevention or mitigation of epidemic diseases at the station.

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References to Subjects and Queries.	REPLIES.
V. INTEMPERANCE.	1. The greater number of soldiers at this station are temperate, but there are several intemperate men; the difficulty in obtaining liquor, however, prevents any intemperance at the present time. 2. The proportions of admissions into hospital from diseases caused by intemperance are,—directly, ·932 per cent., indirectly, 2·588 per cent. I have no data to guide me in making out a statistical table showing the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station; but though drunkenness has not been by any means excessive, yet the use of ardent spirits has been the cause of a good deal of sickness, and the fatal cases have occurred mostly in those men who are of intemperate habits, and drunkenness is by much the prevailing crime at this station. Drunkenness *per se* is punished as an offence. 3. Distilled spirits are sold at the canteens only, and the probable amount consumed by each man per diem is one dram of arrack, but, if there is no beer, then two drams. Spirit does not form any part of the soldiers' ration, but is purchased at option from the regimental canteen, and is never given as a ration to convalescents, nor are any injurious drinks other than intoxicating liquors sold at the canteen or bazaar. 4, 5. The consumption of spirits by troops and convalescents is very seldom conducive to health, even in moderate quantities, and soldiers are seldom moderate, except when they cannot procure it, and that is very seldom. The sale of spirits in the canteen is doubtless conducive to discipline, as liquor is not issued as a part of the rations, and soldiers not being allowed to purchase spirits elsewhere than in the regimental canteen, would, if it were not allowed to be sold there, endeavour to obtain it elsewhere, and would succeed in obtaining an inferior article of a very deleterious description. 6. Ardent spirits, except as a medicine, (which is seldom requisite,) are always injurious, but more particularly in a warm climate; malt liquor is much less so, but should never exceed a quart per man per diem. Good wine is not within the reach of the soldier at this station, but if it could be procured, and taken in moderation, it would not act injuriously. Men with naturally weak constitutions require a certain amount of stimulants in India, and they should consist of beer or porter, to be used at the dinner hour, but never arrack, rum, or brandy. Men naturally robust never require any stimulating drinks. 7. Coffee and tea are used by many of the men, and can be procured early in the mornings at the canteens. Ginger beer is a common beverage, and lemonade is also used, but soda water is too expensive a drink for the private soldier. The influence of these drinks on health, efficiency, and discipline is decidedly good, when intoxicating liquors are abandoned. 8, 9. It would be most beneficial to suppress the spirit ration for every one, and substitute beer, tea, or coffee, provided steps could be taken to prevent the men procuring the deleterious native liquor; but I fear that if the spirit ration was suppressed, many of the men would make increased efforts to procure it. It would also, under the same circumstances, be most beneficial to prohibit the sale of spirituous liquors in the canteens. 10. I would recommend in the strongest possible manner the prohibition of spirits being distilled, except for medicinal and chemical purposes. 11. The canteen rules concerning liquor are agreeable to the Bengal Military Regulations on the subject, and no deviation therefrom is allowed. By the bazaar rules, liquor is not to be sold to European soldiers on any pretence whatever. All liquor shops must be closed at nine o'clock p.m., and not opened before gun-fire in the morning, and no liquor may be brought into the cantonment except by authorized persons.
VI. DIET.	1. The ration for Queen's British troops and European troops in the Indian army is as follows:—1 lb. bread, 1 lb. meat, 4 oz. rice, 2½ oz. sugar, ⅔ oz. tea, (⅓ green, ⅔ black), 1 oz. salt, 1 lb. vegetables, (8 oz. potatoes, and 8 oz. onions or carrots, at present,) 3 lbs. firewood. Six days beef and one day mutton in the week; the meat is the best description of grass fed, and the bread made of Soojee. There are no periodical changes, except in vegetables, which necessarily vary according to the season; potatoes are issued when procurable at a reasonable cost, viz., from October to May; the other vegetables consist of onions, yams, egg plant fruit (Baign), carrots, and turnips. The commissariat officer inspects the rations twice a week as to their quality; the regimental authorities arrange for receiving the correct quantity, the quartermaster or other officer making the inspection. 2. A complete ration is supplied to the troops at this station, but no fruit is allowed, except in hospitals on indent countersigned by the superintending surgeon; the stoppage is 3 annas and 4 pice; there are three meals per day, breakfast, dinner and supper, the hour is a regimental arrangement. The proportion of vegetables in a ration is nearly two-sevenths of the whole. 3, 4. There is no possibility of the men making away with any of the rations, which are cooked by means of copper boilers, tinned once or twice a month, and by saucepans and gridirons. The men are allowed to have their rations cooked in any way most agreeable to their tastes, but the members of each mess must be unanimous in their choice, in order that the native cooks may be enabled to prepare the different dishes; this system has acted beneficially, and has given much satisfaction. The men are not provided by the Government with any refreshment before a march. 5. Soldiers' gardens could not be established advantageously near the station, as vegetables are cheap and abundant during the cold season, and during the hot weather the men would be too much exposed to the climate while cultivating them.
VII. DRESS, ACCOUTREMENTS; AND DUTIES.	1. The soldiers' dress and accoutrements at this station consist of a helmet, cap, shirt, jacket, trousers, stockings, boots, belts, and a pouch; and these are quite suitable to the climate and for the soldiers' duties by day and night, and I can suggest no alteration. In the hot weather the guard dress is khakee clothing both by day and night; in the rains the great coat is worn loose at night, or when raining and during the cold weather the clothing is worn as usual in England. There are no sentry boxes, but the sentries are all posted so that they can take refuge in the verandahs both from the sun and rain. It is advisable, as far as regards the health of the men, that they should be drilled at home, as the wear and tear of their constitutions on first landing is very great. 2. The men rise at daylight during the hot weather, and parade half an hour afterwards, in the cold weather one hour; they have very little drill during the hot weather, occasionally half an hour in the morning. During the cold weather they are drilled four times a week,

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*cont.*	generally for one hour, and once or twice a week for an hour and a half or two hours. The men do not appear to suffer in health from drill.

Breakfast in hot weather at	8 o'clock,	in cold at	$8\frac{1}{2}$
Roll call in barracks	„ 10	„	„	10
Dinner - -	„ 1	„	„	1
Roll call or parade	„ $5\frac{1}{2}$	„	„	5
Evening meal -	„ 5	„	„	4
Tattoo roll call -	„ 9	„	„	8

Early hours are the best for drills, parades, and marches, but in the cold weather they can be done after four p.m. During the week the men have five nights in bed for one on guard.

3. There are no guards at any great distance from the barracks; the bazaar guard is a short quarter of a mile from the parade ground. Guards generally last 24 hours, and when night sentries are required, the men mount at sunset. There are no roll calls at night, the evening roll call falls in on parade, but without arms. There is evening parade with arms during the hot weather.

VIII. Instruction and Recreation.

1. The means of recreation and instruction at the station are, a skittle ground for each company, a school with a good schoolmaster for each regiment or battery, and a library and reading room, fairly lighted for a temporary building. These are sufficient, as far as they go, to keep the men occupied during the heat of the day, and during rain, when the men are all confined to barracks; but this being a new station, there are no ball courts, soldiers' clubs and gardens, workshops, a theatre, and gymnasia, which doubtless will be introduced in due course.
2. Very little means of recreation exist at present, only skittle alleys, but more are promised. A fives court ought to be built, as this game can be played during six months of the year at all times of the day, and even in the hot weather early in the morning.
3. The Government savings' banks seem to answer every purpose.
4. At present there is not sufficient shade from trees, sheds, verandahs, or other means, to enable the men to take exercise without injury to health during the day.

IX. Military Prisons.

1. The building used at present for a military prison is but a temporary one, but orders have been received for permanent buildings, which will be built in due course.

X. Field Service.

1. There are no local regulations for field medical service.
2. As regards the conduct of the line of march of troops, bivouacking, camping, billeting, &c., my experience compels me to say that the medical officers are rarely consulted on these subjects.
3. Camping grounds are laid down by the Quartermaster-General of the Army. If it happens that a camp is a standing camp, the same regulations are observed as if it were a cantonment.
4. There has been no proper field hospital in existence in this district; the sick are conveyed in doolies, which is a very excellent mode. The medicine chest is carried by bamboo coolies, and camels or carts convey the hospital stores. The regulations bearing on these matters are given in the Bengal Military Code, but I am unable to comply with the request of transmitting copies of them.

XI. Statistics of Sickness and Mortality. } No information given under this head.

XII. Hospitals.

1, 2. The present hospital is in one of the old barracks, but the proposed hospital will be on the east of the present cantonment, about 800 yards from the barracks, 400 yards from the nearest horse pickets, and about a mile from the bazaar. The site is airy, open, and freely ventilated. The buildings hitherto used as hospitals are objectionable in every respect; those about to be erected ought to be healthy, as the site is good, and the elevation, drainage, &c. unobjectionable, but the nullah in front must be improved, as it is sluggish and foul, and malaria may be expected to rise from it in its present state.

3, 4. Any supply of water is available by digging wells, and the drainage will be all carried into cesspools as described for the barracks, and from thence removed by the conservancy establishment.

5. With regard to the general structure and arrangement of the hospital, it will be of one story only, the floors of the wards being raised from 5 to 6 feet above the ground; it is not yet settled whether the floors are to be on open arches or on solid blocks as described for the barracks.

The roof water is carried off by flights of steps to a distance of 9 or 10 feet from the main buildings, and is then by means of a kunkur platform removed some 15 or 20 feet further, and the cross slope of the site from thence admits of easy drainage into the nearest open drainage channel. The plan of the hospital sufficiently shows its construction, the walls are of stone, and the main roof is thatched, the double verandah roofs being flat pucka. The roof and walls are sufficiently thick to keep the hospital cool, and there are two verandahs on each side, the use of which for the accommodation of the sick, convalescents, and others has hitherto been unavoidable, but in the new buildings there will be better accommodation.

Date of construction of temporary hospital, July 1859.

Wards or Hospital Huts. (Number.)	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	*For one,* 30,810 *For all,* 154,050	1,540	103	Feet. 2		Feet. None.	Feet.
Present hospital - - 5	20	79	26	15							
Proposed hospital to be built - 10	12 or 16	52	24	24	299,520	2,500 or 1,872	104 or 78	2	44	2	4

MORAR GWALIOR. BENGAL.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	In the artillery hospitals there is about as much cubic and superficial space per cot as in the infantry hospital, and the new hospital will correspond proportionately with the new hospitals for the infantry. The present hospital is properly placed to receive the full benefit of the prevailing winds, and so will the new ones be. In the present building there are no windows, but in the new ones there will be the revolving windows or fanlights, near the top of the side walls, by which, ventilation and coolness ought to be secured. 6. The ventilation of the wards is only secured by means of open doorways below, and open windows above, in addition to ventilating openings in the edge of the roof. I think that the hospital will be thoroughly ventilated and free from odour or closeness. There are no jalousies or jhilmils, but grass chicks or screens are allowed to all hospitals. 7. Tatties are always used when required for cooling the air admitted into the wards as described for barracks. 8. Fire-places will be made for the hospitals, and, if necessary, stoves will be supplied in addition. The walls and ceilings of hospital wards are cleansed and whitewashed, whenever considered necessary as a sanitary measure by the medical officer in charge. 9. The structure of the privies is similar to those attached to barracks, and they will be properly drained, and kept clean by sweepers. This is a matter of internal economy which is dependent on the care or otherwise of the medical officer in charge. 10. The lavatory arrangements in the present hospitals are all of a temporary nature, and though they have been found sufficient, they are neither so complete nor so comfortable as they will be in the new hospital. 11. The only means of bathing for the sick are bathing tubs, which are neither sufficient nor convenient. 12. The hospital linen is washed and dressed by dhobies or washermen; there are no conveniences attached to the hospital establishment for washing or drying clothes. 13. The storage has been indifferent and insufficient, no proper store having been in existence. Tents have been frequently used, but when accommodation could be afforded, the stores were placed at one end of the buildings occupied by the sick, and partitioned off. 14. The bedsteads used in the hospitals are wooden frames laced over with Newar tape, and the bedding consists of one mattrass, one quilt, two sheets, and two pillows. 15. The hospital kitchens are on one flank, and are not commodious; the cooking apparatus is abundant, and diets can be sufficiently varied. In the new hospital the kitchens will be very superior. 16. The diet rolls and tables and all other returns that have been in use for working the internal economy of the hospital are the same as those in existence throughout the Bengal Presidency. 17. Every European hospital has European serjeants; the nurses or ward boys are a most useful and efficient set of men, for whom it would be difficult to find substitutes, whether men or women (if Europeans). Every female hospital ought to have an European matron and assistant, who do many of the duties of nurses, but they are not allowed in Bengal, though found in every European regiment in Bombay. 18, 19. No epidemic disease has appeared in the hospitals; but, as already stated, they are in every respect objectionable, and the new ones are much required, and it is to be hoped that they will obviate all defects. 20. No provision has been made for convalescents for taking exercise; the buildings are not fenced in; nor is there any suitable ground. Shaded walks and seats are equally unprovided, but it is hoped the new buildings will be better provided in every way. 21. With regard to arrangements for the treatment of soldiers' sick wives and children, a building was set apart as a hospital for the women of the 3rd Bengal European regiment when stationed here; but now there are no women and no hospital. The present arrangements are very unsatisfactory, for some soldiers' wives and families may soon be expected from England. 22. There are no particular local hospital regulations enforced at this station. 23. With regard to the powers of the medical officer in matters appertaining to the sanitary state of his hospital, repairs to buildings, change of diet, &c., in repairing and altering buildings, he can only recommend; but in every other respect he has full powers, and no man can interfere with him. Changes of diet, medical comforts, and all internal arrangements are made by him, and for these he is solely responsible to his professional superior. 24. There are no convenient wards at the station, nor any conveniences for convalescents.
XIII. BURIAL OF THE DEAD.	1, 2. The burial ground at present used by British troops is on the left flank of the station. The westerly winds passing over it do not affect any of the barracks, unless the direction is almost northerly, which is very seldom the case. A new burial ground, 200 yards long by 100 yards wide, is about to be made on the right front of the European lines, which being to the east will not affect the barracks in any way. The soil is argillaceous, the subsoil on the spot unknown, and the drainage will be easily effected. 3. I have allowed 17 feet by 10 feet for each grave, which will allow at least 4 feet between two graves; they are 6 feet deep, and never reopened. Interment is compulsory, at ordinary times and during epidemics, about 12 hours after death. 4. I have never noticed anything offensive in the graveyard. Soldiers are generally buried in proper coffins, at a depth of 5 or 6 feet below the ground, and I have never known an instance of a grave used for the purpose of a second burial on the same spot. 5. The bazaar people, if Mahommedans, bury their own dead most scrupulously in the nearest Mussulman burying-ground. Hindoos generally burn their dead. 6, 7. No injury to public health arises from native interments, and I can suggest no improvements in the way of regulation, or otherwise, in the burial or disposal of the dead.

(Signed) J. K. McCAUSLAND, Brigadier,
Commanding Gwalior District.
F. S. ARNOTT, M.D., Superintendent-Surgeon,
Gwalior District.
W. S. OLIPHANT, Captain,
Executive Engineer, Gwalior Division.

30th March 1860.

SEETABULDEE.

Accommodation.—Native Troops { Artillery - 8 Havildars 8 Naicks, and 122 Privates. Cavalry - 6 Kote Duffadars, 48 Duffadars, 480 Sowars. Infantry - 48 Havildars, 48 Naicks, 800 Privates.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is hilly, basaltic, and dry. There are three large tanks and two small rivers in the vicinity, but not much wood or jungle. 2. The elevation of the station above the sea is 939 feet, but it is on the same level as the adjacent country. There is no higher or healthier ground adjoining the station. 3. The nearest high land is Ramakonah, 52 miles distant. 4. The Taklee river, distant one mile from the cantonment, is the nearest water. The vicinity of the station is not liable to overflow, and there is no broken ground ravines or water pits near. 5. The station is open and freely exposed to the prevailing winds. The buildings within it are not exposed to reflected sun heat, nor to cold or variable winds. 6. The surrounding country is under dry cultivation, but there are no works of irrigation. 7. The city of Nagpore is distant two miles from the station. 8. The station occupies both new ground and ground which had been previously occupied. 9. Water is found during the dry season from 20 to 30 feet below the surface, and from 10 to 15 feet during the rainy season. 10. The rain-fall sinks into a pervious subsoil. The drainage of a few small hills passes into the subsoil of the station. 11. The water supply is derived from wells; water is not stored in open tanks. 12. The amount of water supply is moderate, but the water is of good quality. It is raised by a rope and native bucket. A better supply could be procured by sinking more wells. 13. There are no other topographical points bearing on the health of the station. 14. A portion of this station was chosen by a committee composed of two military and one medical officer in 1854. No improvement is suggested as to the manner of selecting new stations.
II. Climate.	1. There are no means or instruments at the station for conducting and registering meteorological observations. 2. The following Table is the result of 2½ years of observation at the artillery and irregular cavalry hospitals from June 1858 to December 1860:—

Months.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain Inches.
January - -	71	12	80	61	—
February - -	79	19	84	75	·88
March - -	83	10	88	78	·2
April - -	91	9	97	87	2·2
May - -	95	9	99	92	·8
June - -	88	6	90	86	3·82
July - -	83	2	84	81	13·07
August - -	81	2	83	80	12·42
September -	82	4	84	80	11·1
October - -	81	7	85	77	·9
November -	74	10	79	69	—
December -	69	9	74	65	1·06

3. The climate is good. It is hot from the 15th March to the 15th June; wet till the 30th September, and during the remainder of the year cool. The troops are healthy. They are all natives, and clothe and diet themselves. Immediately after the rains until the end of November, fevers are prevalent; the hot season is the most healthy one.
4. There is no district near the station which would prove more conducive to health for natives.
5. The following are the stations at which Captain Shakespeare has served, with the observations on their comparative salubrity:—Dinapore, in the Bengal presidency, moderately healthy; Berhampore, unhealthy; Mizapore, moderately healthy; and Chunar, healthy. Bolarum, Hyderabad, Deccan, healthy. In the Deccan, Mominabad, very healthy; Hingoliee, healthy; Ellichpore, unhealthy; Arungabad, moderately healthy; and Seetabuldee, Nagpore, healthy.

Lieutenant Smith has served at (1) Trichinopoly, healthy; (2) Hurryhur, healthy; (3) Secunderabad, unhealthy; and (4) Bellary, healthy.

From July to September 1854 Dr. Wyndame served with the 50th Madras Native Infantry at Madras, cholera prevailing the whole time. He accompanied the regiment on the march to Secunderabad during September, October, and November; cholera still continuing until they crossed the Kistnah river, when it suddenly and entirely ceased. During November and December 1854 did duty with the 2nd Madras Europeans at Secunderabad, when dysentery was the most prevailing disease. From thence marched to Seetabuldee, and assumed medical charge of the 23rd Madras Native Infantry, remaining with that regiment till March 1855; intermittent fever was the chief disease from which the sepoys suffered. During March 1855 he did duty with the artillery at Kamptee, and in April proceeded to Chandah, and was placed in medical charge of the 2nd infantry, Native Infantry force, and also of the civil duties. The sepoys suffered chiefly from intermittent fever; the civil population from biliary intermittent fever and dysentery. Neither cholera nor small-pox had been known in the city or district for many years previously, but since then both diseases have made their re-appearance. In December 1855 he was appointed to the Nagpore Irregular Cavalry, which appointment he has held since, having accompanied the regiment on service at Raipore Sumbulpore, Chandah, Chindwana, Bintool, and Ellichpore districts, from 1857 until March 1859. In the absence of any means of information to be derived from hospital records, &c., it is impossible to give more than an opinion founded on personal recollections as to the comparative salubrity of the above-named stations. Madras enjoys a high and pretty uniform animal temperature, cooled by the sea breeze which sets in in the afternoon. Cholera and liver diseases may be said to be endemic there. The climate of Secunderabad is hot from March to June; rainy (monsoon) from June to September; cooler from October

SEETABULDEE. BENGAL.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	to March. Dysentery is the most prevalent and fatal of all disorders amongst European troops. Both intermittent and remittent fevers occur. Chandah, whose climate is much the same, has the same prevailing diseases, but is more healthy than Nagpore.
III. Sanitary Condition of Station.	1, 2. A map of the country and skeleton plan of the cantonment are transmitted. 3 to 16. No reply to these querries. 17. The surface cleansing of the cantonment is performed generally by sweepers daily; the refuse, &c. being removed to a distance. 18. The surface of the cantonment is kept free of vegetation. 19. Sweepers keep the bazaars clean. The bazaars are healthy, and are supplied with water from wells. A sanitary police to prevent nuisance would be of great use. The native houses near the station are tiled. No dung heaps or cesspits are allowed. 20. No reply to this query. 21. There are but few camp followers' horses, and they are picketted by their owner's houses. The dung is conveyed away by sweepers. 22. The irregular cavalry stables are long open-tiled buildings, between two rows of the men's houses, and about 30 yards from each row. The dung is daily cleared away. The horse battery horses are in the open, and are not stabled. The hospital is about 150 paces from the horse lines in both. 23. The European serjeants of the infantry and horse battery have sufficient accommodation. They are married men.
Officers' Quarters.	1. The officers' houses are chiefly thatched bungalows, there being no quarters found by Government. The drainage and ventilation of these buildings are good.
IV. Health of the Troops.	1. The station itself and the district in which it is situated are healthy, and the country people free from severe endemic disease. The population, however, of Nagpore is unhealthy, and severe epidemics of cholera, biliary remittent fever, and small-pox, often occur, and prove fatal to large numbers of the inhabitants. 2. Intermittent and remittent fevers, dysentery, epidemics of cholera, biliary remittent fever, and small-pox, are most prevalent among the natives. Spleen disorder is a comparatively rare complication of the prevalent fever. 3. The healthiness of the station and district is mainly attributable to the absence of jungle, of low vegetation and swampy ground, and to the cultivation in the neighbourhood being dry. Both the cavalry and artillery lines are on open ground, with a good slope, allowing of perfect drainage. Defective ventilation, insufficient drainage, and overcrowding, fully account for the unhealthiness of the city of Nagpore. 4. The native cavalry and artillery are stationary here. The infantry regiment has recently arrived from Chandah in the province, where it has been stationed since 1855; and whilst there it enjoyed good health, suffering chiefly from intermittent fever. The right wing arrived here on January 28, 1860, in good health. The left wing arrived on March 28, 1860, and when within a day's march of Nagpore cholera broke out and prevailed for about a week after arrival; since then the regiment has suffered chiefly from intermittent fever. The infantry lines are perhaps more unhealthy than either the artillery or cavalry lines, which is attributable to the situation not being so open, nor the ground so well drained. The lines also occupy old ground, are in the proximity of a large bazaar, and the ground in the immediate neighbourhood is used by natives for the purposes of nature. The more frequent night duty may also, in some measure, account for it. 5. The troops are not camped out. 6 to 24. No replies to these queries.
Diseases.	1. There are no inspection parades for the discovery of incipient diseases among the troops. 2. There has been no scorbutus among the troops at the station. 3. Amongst the total number of sick (640) treated in the Artillery Hospital during the years 1856, 7, 8, 9, and 60, not a single case of hepatic disease has occurred. From a total of 1,341 patients treated in the Cavalry Hospital during the same period, 8 cases have occurred out of a total of 3,054. Amongst the infantry, 7 men have been admitted suffering from this disorder. Thus hepatic disease bears the small proportion of ·25 per cent. to other ailments, and being so rare, no special prophylactic measures need be referred to. It is usually the consequence of fever or dysentery. 4. Dracunculus does not prevail in the province. Out of a total of 5,035 sick, 2 cases only have occurred. In one the history is not given, and the other, which was in the Artillery Hospital, the patient had recently arrived from Bombay, where the disease is very prevalent. 5. In the Artillery Hospital venereal diseases occur in the proportion of 8·28 per cent. to other diseases; in the cavalry the proportion is nearly 3 per cent.; and in the infantry 1·47 per cent. Native soldiers, being for the most part married, are not very liable to syphilitic diseases, the artillerymen, being younger and mostly unmarried, having suffered most. Syphilis prevails to a great extent, and in a virulent form, in the city of Nagpore; and as European troops, both artillery and infantry, are to be permanently located in barracks at this station, the establishment of a lock hospital, and a system of regular supervision, &c., would be highly advantageous. 6. Remittent and intermittent fevers occur among the troops as endemics; biliary remittent as an epidemic. Dysentery (colitis) is endemic, and Asiatic cholera and small-pox as epidemics. Rheumatism also occurs chiefly among the aged. The proportion of admissions from intermittent fever to total admissions from all diseases is 31·11 per cent., and of deaths to total deaths 13.04 per cent. Remittent fevers: admissions, 1·02 per cent.; deaths, 6·52 per cent. Dysentery: admissions, 2·33 per cent.; deaths, 4·34 per cent. Cholera: admissions, ·45 per cent.; deaths, 21·73 per cent. Small-pox: admissions, ·06 per cent.; deaths, none. 7. Bilious remittent fever, cholera, and small-pox are the most frequent zymotic diseases. The former most frequently occurs during the months of September, October, and November, the drying-up season after the monsoons, the latter two being most prevalent during March, April, and May, the hot months. These diseases attack for the most part the dwellers in the crowded bazaars, and occur to a very large extent among the population of the neighbouring city, where overcrowding, defective ventilation, and want of cleaniness prevail. Drunkenness and the use of bhang and opium, which is rife among the native population, predispose them to these diseases, and greatly increase the mortality from them. Among the troops, night duty, when severe, quickly increases the number of sick in hospital.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	8. No reply to this query. 9. Small doses of quinine have been tried successfully as a prophylactic against malarial disease. 10. In order to prevent or mitigate malarial disease at the station the infantry parade ground should be drained, and the natives compelled to proceed to a greater distance for the purposes of nature. The use of bhang and opium should also be prohibited. The latter is not sold in the military bazaar, but is procured from the city and civil bazaars.
XII. Hospitals.	1. A plan of the Artillery Hospital is transmitted. The Cavalry Hospital is precisely similar, but double the size. 2. The Cavalry Hospital is situated about 120 yards in rear of the men's huts and stables, the bazaar being in front. No houses are near. The site is healthy, well drained, and free from all sources of malaria. The Artillery Hospital is to the east side, about 100 yards from the horse lines, and on an open, well drained site. The Infantry Hospital forms a part of the other barrack buildings, which interfere to a certain extent with its ventilation. The parade ground, which is in its rear, is during the rainy season almost a swamp. 3. The water supply is abundant and wholesome from wells. 4. There are no means of drainage; the refuse water and other impurities are carried away by the sweepers to some distance in the rear of hospitals. 5. The floors of the wards are not raised, and are not ventilated beneath. The roof water sinks into the subsoil. There is no surface drainage, a sufficient slope facilitating the speedy drainage away of all water. The hospitals are built of brick and mortar, covered with chunam, the roof and walls being single. They are sufficiently cool for natives. The buildings are supplied on either side with a verandah 10 feet wide, which are used occasionally for the accommodation of the sick when the wards are full. The hospitals consist of single flats.

Table of Hospital Accommodation.

Date of Construction - { Artillery Hospital - 1855. Cavalry Hospital - 1856.
Total Number of Wards - - - 4.
Total Regulation Number of Beds - 102.

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.
		Length.	Breadth.	Height.	Cubic Contents.			
		Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ins.
Native Artillery Hospital, Ward No. 1	24	72	20	18	25,920	1,080	60	16
Do. Cavalry do. do. No. 1	24	72	20	18	25,920	1,080	60	16
Do. do do. do. No. 2	24	72	20	18	25,920	1,080	60	16
Do. Infantry do. do. No. 1	30	107	18	11	21,186	706	64	16

	The hospital is so placed as to receive the full benefit of the prevailing winds. There are no windows. 6. Ventilation is effected by means of roof ventilators and by gratings in the lower panel of each door, which admit of being closed at pleasure. There are no jalousies or jhilmils. 7, 8. There are no artificial means for cooling or warming the wards. The walls and ceilings of the wards are whitewashed annually. 9. The privies, which are situated in the rear of the hospitals, are washed out daily, the filth, &c., being removed by sweepers. They are not offensive. 10 to 24. There are no lavatory arrangements. The sanitary condition of the hospitals is good.
XIII. Burial of the Dead.	The dead of camp followers and bazaar people are buried or burnt, according to their creed, on ground chosen for that purpose at a distance from the cantonment. No injury accrues to the public health from the present practice.

(Signed) Henry Shakespeare, Captain Commanding Nagpore Irregular Force.
H. D. B. Smith, Lieutenant, Executive Engineer.
S. Jardine Wyndame, M.D., Assistant Surgeon in Medical Charge Cavalry, Artillery, Staff, and Details, Nagpore Irregular Force.

KHERWARRAH.

Accommodation.—Native Troops - - { Cavalry, 1 Troop of Regular Cavalry. Infantry, 7 Companies of the Mewar Bheel Corps.

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is irregular, hilly, and mountainous, and in most of the ravines and plateaus remarkably swampy. The country is wild, and there is an abundance of wood, jungle, and water in the vicinity of the station. 2. The elevation of the station above the sea is about 1,200 feet, but no exact data exist to show the elevation with regard to the adjacent country. It is, however, commanded on all sides by small isolated hillocks, which are higher than the general elevation of the station proper. There is no lake or canal in the immediate vicinity, but the station is intersected by a nudder

KHERWARRAH. BENGAL.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	or river having much malaria generating ground in its track; and close alongside its leeward and highest bank are situated the bazaar, fort lines, hospital, and village of Kherwarrah. There is also much swampy ground behind or to the leeward aspect of the bazaar, part of which is now much aggravated in insalubrity by having been used as a brick field. A large drain courses through this situation, on both sides of which the ground is oozy, spongy, and swampy during the malarious season. There is no higher or healthier ground immediately adjoining the station. 3. The highest hill in the Arabulli, according to Major Brooke and Dr. Bowhill, is Kŭmmŭl-nath, about 16 miles N.E. from Soame, or about 30 or 35 miles from Kherwarrah. Those gentlemen who spent May and June 1845 upon its summit, consider that it is 4,400 feet above the level of the sea, or 3,200 feet higher than this station. Water was found during that time 15 feet from the surface. 4. The nearest water flows through the nullah or river before mentioned, which courses through and intersects the cantonment lands. During heavy falls of rain, portions of ground in and around the station are subject to overflow, but the fall being good the water rapidly disappears, except in numerous holes and hollows where it stagnates, till dried up by the slow process of absorption and evaporation. The overflow is liable to occur in and below the brickfields. The ravines near are doubtless very prejudicial to the health of those passing through them or in their immediate vicinity during the rainy and drying up months, as much malaria is produced therein. 5. The station is open, freely exposed to the prevailing winds, and not so encumbered with trees, hedges, higher ground, &c., as to interfere with the freest external and internal ventilation The temperature of the bazaar, fort lines, and village is higher than that of the less densely populated parts of the station, owing to the reflection of sun heat from tile roofs and pucka walls. The station is much exposed to land winds but not immediately to the sea breeze. When the land wind blows from the east, intermittent fever, influenza, and chest complaints increase in frequency. 6. Not more than one-sixth of the surrounding country is under cultivation. All the cold weather crops are irrigated from wells, or where conveniently placed from rivers both in and out of the station, but there are no works of irrigation near. Artificial irrigation affects the health of the station injuriously, but it appears to me that it is the abuse and not the use of irrigation, under proper conditions, that proves so deleterious. Rice cultivation within the cantonment limits is prohibited. In one or two situations to the S.W. it is cultivated up to within a quarter of a mile of the boundary. No indigo is cultivated, or hemp or flax prepared near the station. 7. There is no large city or town near, but the village of Kherwarrah adjoins the lines of the Bheel corps on the one side, and the bazaar almost adjoins them on the other. 8. The geological structure of the district belongs to the primary formation. The bazaar, fort, hospital, lines, and village, as also the quarters of the commissioned and non-commissioned officers stand on solid trap. The soil is ferruginous, and stony, or dark, and rich in organic matter. Gneiss, greenstone, trap-rock, hornblende, quartz, amygdaloid, decomposing trap-argillaceous and mica schists, granular limestone, conglomerate, have been identified. Hematite and galena exist at Jowrah on the highway to Odegpore. The ground on which the station stands was never occupied by a population prior to the raising of the corps in 1840-1. 9. The average depth below the surface in 14 wells at which water is found during the dry season is 27 feet 6 inches, and 9 feet during the rainy season. 10. The rain fall, generally speaking, flows readily away; what is not carried off directly by the nudders, &c., sinks into the soil, and near the edges of rivers it oozes out as springs. It only lies on the surface till evaporation takes place in puddle holes and similar places which abound within and without the station. The drainage from the adjacent higher ground also passes into the subsoil of the station. 11. The water supply of the station is derived from wells during the cold and hot months, and from the nullah or river during the monsoon months. There are no tanks for storing the water. Some of the wells are contaminated from leaves and other matters falling into them; as also from the percolation of foul drainage through the subsoil and their walls. 12. The supply of water is abundant at all times. That from the wells, used by the natives, is semi-transparent, moderately hard, and not unfrequently has a fishy taste and disagreeable organic smell. In our garden wells, which are worked for irrigation purposes, it is much more wholesome, transparent, tasteless, and odourless, but even here it is much the safest plan never to use any water that has not been either boiled or filtered, as guinea worm is very prevalent here. Its chemical composition cannot be given, but it contains an abundance of carbonate of lime. It is usually considered good. It is raised by hand in leathern vessels from wells or by metal vessels or lotahs, and is distributed by bheesties. I think the well in the lines is contaminated by percolation into it of the foul subsoil drainage from the village and bazaar. 13. No reply to this query. 14. New stations have been chosen lately by a mixed committee of engineer, military, and medical officers, but the majority of our stations have been selected, not from sanitary as well as military considerations, but from the latter only. No new station, whether on the hills or plains, should ever be fixed upon until the opinion of a medical committee has been obtained regarding its eligibility in a sanitary point of view. If possible, and it ought generally to be so, the committee should sit during some period of the monsoon season, where sanitary excellences and imperfections may be detected with the greatest facility. The decision of this committee should not be overruled except from military and political considerations of the highest importance. It should always be borne in mind that the best sanitary site is generally the best military situation also; there are exceptions, but these are few, and do not interfere with the validity of the rule enunciated.
II. CLIMATE.	1. The instruments available at the station for meteorological observations are one wet bulb and one dry bulb thermometer.

2. Table of meteorological observations for five years, from 1st January 1854 to 31st December 1858 :—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Winds, Dews, Storms, &c.
January -	—	64·37	21·09	74·03	52·94	64·37	57·73	88·06	—	S., W., E., and N.	Calm and moderate.	28·4*	Clouds, night fogs, & dews.
February -	—	70·74	24·52	82·19	57·67	70·74	62·14	93·80	—	S.E., W., E. and N.	Do.	27·0*	Occasionally cloudy.
March -	—	78·71	23·98	90·96	66·98	78·71	67·38	100·60	—	S.E., E., N.W., & W.	Moderate	29·0*	Ditto.
April - -	—	88·70	23·32	99·34	76·02	88·70	71·34	110·60	—	W., S.W., and N.	Do. and stormy.	28·2*	Generally clear sunshine.
May - -	—	93·82	18·13	102·57	84·44	93·82	73·82	110·70	—	W. & N.W.	Do. high & stormy	30·2*	Ditto, with hot winds and thunder storms.
June - -	—	87·46	11·83	93·02	81·19	87·46	75·44	109·60	4·027	S.W., W., and S.	Do. monsoon.	27 8*	Cloudy, thunder storms.
July - -	—	82·11	8·98	86·86	77·88	82·11	74·09	97·08	12·333	S.W. & W.	Monsoon	17·2*	Ditto.
August -	—	80·17	8·90	85·10	76·20	80·17	77·64	94·30	3·863	W.	Do.	16·2*	Cloudy without storms.
September -	—	81·07	11·62	87·65	76·03	81·07	75·16	98·70	6·459	W., N., and N.E.	Do.	17·4*	Ditto, with thunder storms.
October -	—	77·10	19·33	86·98	67·65	77·10	70·26	98·80	0·835	W., E., and N.W.	Calm.	29·2*	Bright sunshine.
November -	—	68·01	25·90	80·80	54·90	68·01	61·47	92·70	—	E., N., E., and W.	Do. and moderate	29·4*	Sunshine, and occasional fogs.
December -	—	63·74	21·92	74·38	52·36	63·74	57·35	90·16	—	N.E., N.,E., & N.W.	Do.	30·2*	Ditto, fogs, and dews.

* If at 4 p.m. the sun shines, then each day in the meteorological register is counted a day of sunshine. It is at this period (4 p.m.), that the temperature in the sun's rays is directed to be taken and registered.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. During March, April, May, till 20th June, the climate is very hot, dry, and comparatively non-malarious; from 20th June till the 20th September, the temperature is lower, more equable, and the air loaded with malarious exhaltations; from the 20th September to 20th November the vicissitudes are marked and of daily occurrence, and intermittent fever, splenic enlargement, &c., abound; from 20th November till 1st of March the air is cold, but very variable, and fogs prevail. The trees around in March, April, May, and June, exercise a cooling effect; the air, however, is filled with dust, and July, August, and September the atmosphere is impregnated with noxious organic matter. The drill season commences here on or about the 15th October, and there can be no doubt that when the men are kept long out in the mornings or evenings, returning as they do to their lines heated and fatigued, to substitute the merest apology for efficient clothing for their uniform and accoutrements, and then go to rest, their health suffers in October and November. The drill with night and day guards, large amount of escort duties, and the habit the men have unavoidably been allowed to indulge in of going to their homes at distances varying from half a mile to six miles or more from the station, when not immediately required for duty, is, in my opinion, too severe in October and November. The exercising season should not commence here till the 20th of November.

The healthy and unhealthy months are shown in the subjoined table, for 17 years, from September 1841 to August 1858.

Months and Quarters.	Monthly Per-centage of Admissions to Strength.	Monthly Per-centage of Deaths to Strength.	Monthly Per-centage of Admissions to Strength exclusive of Dracunculus.
17 Septembers - - - -	13·40	·041	12·79
17 Octobers - - - -	13·13	·071	12·56
17 Novembers - - - -	15·31	·065	14·98
1st Quarter - - - -	15·93	·050	15·42
17 Decembers - - - -	12·97	·047	12·80
17 Januarys - - - -	9·44	·065	9·31
16 Februarys - - - -	8·19	·056	7·79
2nd Quarter - - - -	10·23	·056	10·00
15 Marches - - - -	10·08	·066	8·48
17 Aprils - - - -	8·77	·041	6·26
17 Mays - - - -	8·61	·125	5·47
3rd Quarter - - - -	9·12	·101	6·67
17 Junes - - - -	8·91	·053	6·00
17 Julys - - - -	10·29	·029	8·06
17 Augusts - - - -	11·89	·070	10·39
4th Quarter - - - -	10·37	·051	8·16

Malarious fevers, spleen disease, &c. prevail most during the unhealthy months.

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	4. No reply to this query. 5. I have served at Dum Dum, Barrackpore, Dinapore, Ajmere, and Kherwarrah. Dum Dum appears to be more salubrious than Barrackpore, and Dinapore, more so than either. The civil station of Ajmere is located on the leeward side of a removeable swamp of a most pestilential character. Kherwarrah, the station of the Mewar Bheel corps, is the healthiest station I have seen, but none of these stations has had fair play. Nothing has struck me so much as the utter disregard which prevails regarding the commonest sanitary precautions. A large proportion of the sickness at Dum Dum, Barrackpore, Dinapore, Ajmere, and Kherwarrah, is owing to the absence of a properly organized and efficient executive sanitary department to take the charge and management of the conservancy duties, and to attend to all other sanitary matters requiring effective, prompt, and unremitting executive action.
III. SANITARY CONDITION OF STATION.	1, 2. No plans of the station, &c. have been transmitted, as there is no engineer officer present. 3 to 8. There are no barracks at Kherwarrah. 9. The serjeants' and sepoys' tents here are constructed of two layers of thick cotton cloth, with a thinner layer of blue colour inside. The cavalry lines (now unoccupied) are built of bricks and mortar, with tiled roof, and the sepoy's huts of compressed mud and tiled roofs. 10. The floors both of the Government huts for cavalry, and in the Bheel corps' lines are raised a foot above the ground, but there is no ventilation beneath them. 11. If the cavalry huts were properly ventilated, they would be great improvements upon the rude and unsubstantial mud hut or wattle and daub. Ventilation can only be effected by a single door; and upwards, during the cold season, by interspaces at the joinings of the tiles and at the joists. As, however, during the hot seasons and rains, the temperature of the air is, especially in the day time, higher outside than within these huts, instead of the foul air passing out in an upward direction it can only escape by the single door. In fact, instead of the openings in the roof, &c. giving exit to foul air at the season mentioned, they more commonly admit hot air ranging from 100° to 130°. The consequences that would result from such a state of things are much obviated by the men sleeping outside during the hot weather and the fair nights of the monsoon. There ought to be at least two opposite doors, facing towards the prevailing winds in every native hut, extending from the floor level to the joists, in order to insure free perflation and the renewal of fresh air. Somewhat similar rules may be applied to European barracks and tents. All barracks for European troops should, in plain stations all over India, be raised on arches, six or eight feet high, and double storied. The rooms should be capacious, lofty, well ventilated by doors, and swing windows at least 9 or 10 feet high, facing the prevailing winds, and extending from the flooring upwards. The cantonments are kept in repair by the engineers. The officer commanding is responsible for the general sanitary state of the station. Repairs, especially small ones of much immediate importance, are not always so quickly executed as is desirable. 12, 13. There are no lavatories or cookhouses for native corps. Natives cook their own food and wash their own clothes. 14, 15. These queries do not apply to native troops. 16. My hospital is particularly dry and free from damp. All refuse from it is collected in earthenware vessels, and either buried at a distance or burnt on the spot. There are no cesspits. The nudder is sometimes very foul, as also is the drain passing in the front of the dhurmsala from serious inequalities in its levels. A large portion of this drain has been cleaned and adjusted as regards its levels and inclines, at my recommendation, during this season, and the commanding officer has promised to continue the cleaning out and levelling right through the brickfield near the dhurmsala. Both the nudder and drain are close to the station, and rather within it, as before pointed out. 17. There is no conservancy establishment especially appropriated to preserve cleanliness in the station. The cleansing beyond the lines is left very much to the jackal, vulture, and carrion crow; patrols are, however, posted at several points of the station to prevent the inhabitants from committing nuisances, except in specified localities. This is only partially successful. The lines are kept clean, but the sweepings are deposited 30 yards to the windward side of them. 18. The surface of the cantonment is far from being kept free from vegetation; every morsel of land that can be cultivated being made use of by the villagers. This is bad in a sanitary point of view, especially with ignorant natives for the cultivators. All land in stations should be converted into grass-growing grounds, planted with fine growing trees well removed from each other, and kept well fed down during the rainy season, like an English park or pasture. There are no old walls, thick hedges, &c. to interfere with the ventilation of the station. 19. The bazaar is situated on an elevated ridge of trap-rock on a high bank of the river, having a capital descent on three sides for the escape of the monsoon water and drainage, and it is freely perflated by the prevailing winds. The water supply is not so abundant as in other parts of the station, except during the rains. The main street is kept clean, but in all other situations, in the little bye-ways, the most ordinary precautions are lost sight of practically. Every family has its own cesspool. There is overcrowding within family huts. The conservancy establishment of the bazaar consists of a couple of sweepers. The mud and wattle and daub huts around the station denote a poverty-striken and semi-barbarous state; dung-heaps are close to every hut, and also holes for ordure. Nuisance is frequently experienced in large stations from the wind blowing over native dwellings. The cause is the utter neglect by the natives of conservancy arrangements. The nuisances may, to a great extent, be prevented by levelling to the ground every native hut within a circle of 200 or 300 yards of all barracks, by converting the open space that would thus be procured into even and well fed down pasture ground, by enforcing the opening out of capacious principal and secondary streets, and by maintaining an efficient system of "dry conservancy" throughout the whole town, village, or city. 20. Animals are slaughtered here on the windward side, and in a suburb of the bazaar. There are no special rules applicable to these places. The offal is thrown outside the houses of the butchers, and there left to be consumed by the dogs, jackals, and vultures. During the rains more particularly proximity to these places is intolerable both to natives and Europeans, the stench arising from the heaps of offal, the increasing accumulations of years, being sometimes dreadful. The nuisance might be avoided here, where there are only two or three butchers, and where very little slaughtering takes place, by merely enforcing cleanliness in and around them, and the assiduous removal, burial, or destruction of all offal.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	21, 22. There have been no cavalry stationed at this place since June or July 1858. The lines of the cavalry, and of those of the Bheel corps are about 200 yards from the bazaar, and the horses used to be picketed close to the rear of the troopers' huts. No special arrangements were ever made to remove the manure and filth; it was deposited in heaps close to the leeward side of the picketing grounds, and a portion of it was removed to manure our gardens. The picketing ground is of an oblong shape, and the horses used to be arranged in lines or rows, with a passage between each. The distance of the nearest row of horses from the men's accommodation was about 30 yards. 23. The non-commissioned officers attached to this corps are the serjeant-major and quarter-master-serjeant. Their quarters consist of two isolated bungalows, each of which have two rooms, a verandah 10 feet wide on three sides, a good bath-room, and a cook-house, and necessary detached.
Officers' Quarters.	1. There are no Government quarters for officers, each living in his own private bungalow, which are built on elevations of trap-rock. The natural drainage, site, ventilation, and conservancy arrangements are excellent. The houses require no improvement, but I think it injurious to allow the grass to grow up during the monsoon to be converted into hay for horses or cattle; it would be better to keep it well fed down.
IV. Health of the Troops.	1. The station, district, and native population is decidedly unhealthy, but chiefly from causes which can be mitigated or removed. 2. The diseases most prevalent among the natives are malarious fevers, splenic enlargement, with the splenic cachexia of tropical authors, or the leucocythemia splenica of Dr. Wilks; diarrhœa, cholera, small pox, dracunculus, &c. 3. The unhealthiness of the neighbouring population is owing to the luxuriant jungle which encircles on all sides the marshy and swampy localities, in and near which the people dwell all their lives; to small, cramped, damp, and ill-ventilated dwellings; to defective clothing, bad food and water, overcrowding, sheltering cattle, sheep, and goats under the same roofs as are tenanted by the people themselves; to neglected cesspools, middens, and exuviæ of men and animals; to the absence of artificial drainage; to opium eating, tobacco and ganjah smoking, and spirit drinking. 4. The corps at this station is a local one. The village of Kherwarrah is more insalubrious than the lines or bazaar, and the reason is that it lies at a lower level, is comparatively badly ventilated, and worse attended to as regards conservancy. It is surrounded on two sides by jungly vegetation during the monsoon, and also barricaded on two sides by an immense midden, the accumulation of many years. 5. A large number of the men are always out on escort duty. With the exception of September, October, and the beginning of November, travelling about appears to agree uncommonly well with them; but during the period mentioned they suffer most severely from malarious fevers, spleen disease, and splenic cachexia. 6, 7. I have never been in charge of troops at hill stations. 8. I approve of selecting hill stations for European troops. 9. Diarrhœa and chronic dysentery are the diseases peculiar to hill stations, especially in those persons who have been debilitated by the exhausting heats and malarious diseases of the plains. 10. On going to hill stations the men's diet should be substantial, composed of a due admixture of animal and vegetable food of the first quality procurable. The water should be the object of especial attention; an adequate quantity of good beer should always be given, and every man should be supplied with an efficient number of flannel shirts. No man, whether healthy or unhealthy, can be too warmly clothed on the hills after having passed some sickening years on the plains. The barracks or huts should be large, commodious, well ventilated, and have other appurtenances, such as latrines, lavatories, cook-rooms, &c. to match. 11. The best season for residence in hill stations is from March to November, and probably a year is the shortest period of residence to obtain the full benefit of those stations. If the troops have been sickly before they were sent thither a shorter residence than a year would not afford the desired result. 12. With excellent food, water, and beer; good capacious huts or barracks; with constant occupation and amusement, such as drills, exercises, and cricket, rackets, foot-ball, &c., and with an abundant supply of clothing, the longer troops remain in the hills the better qualified ought they be to undergo the hardships inseparable from residence in plain stations. 13. Troops should never be called upon, except from state necessity, to leave the hill stations from April to October inclusive. They should leave at a period which would allow them full time to reach their destination in the plains in February. 14. To locate troops in the hills, with short periods of service on the plains, would in my opinion be most conducive to the preservation of the health and longevity of the British soldier. When the railway system is completed the practicability and advantage of such an arrangement to the soldier and the state does not admit of a doubt. Frequent change of station in the plains would be beneficial if the march can be begun and ended within November, December, January, and February. 15, 16. No experience. 17. Kŭmmŭlnath, about 30 or 35 miles from Kherwarrah, could be advantageously occupied as a hill station. Major Brooke states, that "there is a good made road the whole way "up to the top of the hill, laid out with great skill and a very able work." Again—"The "top of the hill, about two miles long, is fortified. On the east this fortification is "Titanic, the size of the stones composing it being very great, and the height of the "scarped and built up face very considerable. Within the fortifications are the ruins of a "large town, with numbers of temples, wells, &c. The highest parts of the hill are to the "north, where there is a fine plateau with the remains of a talao." Water is abundant. The elevation of the hill is 4,400 feet above the sea. The climate is good and bracing, two or three degrees lower than that of Mount Aboo. 18. The sandy, gravelly, and porous soils of Nusseerabad and Neemuch are, according to my experience, more healthy than the black organic soils in the valley of the Ganges. Clayey soils are damp and retentive of moisture. 19. Soldiers proceeding to India should be from 20 to 22 years of age, and should land there in November or December. Troops landed at this period could be pushed from the port of

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	disembarkation up country to their destination, during the cold months of January and February, before the heats of the latter part of March, April and May set in. Troops are often on first landing badly accommodated in depôts. Their drills, duties, and marches entail too much exposure, more especially in the hot months. Recruits on arriving in India should be marched or conveyed by land or water carriage, as the case may be, to their respective regiments without delay. If landed in November or December it would always be practicable to do so, so far as climate is concerned. 20. In the absence of accommodation in the healthy hill climate of India it might be advantageous to send troops from intermediate stations, such as the Cape of Good Hope, but I think experience will prove that it will be the best plan to make hill stations take the place of intermediate colonial stations. 21. The mode of transport from the port to the interior is by steamers, with flats attached, and sometimes by boats. By land troops generally march by regular stages, or by bullock trains or railway if available. I believe the mode of transport is of less consequence to health than the season of the year chosen for the removal of troops from one place to another. For example, any of the above modes may be employed with impunity in the cold months, whilst all may be detrimental during the hot and rainy months. 22. It would be difficult to assign the limit of a British soldier's service in India from the present data, if the different regiments could spend long periods on the hills with short periods on the plains. Even with equal periods on the hills and on the plains, the number of years he might serve with comfort to himself and benefit to the State, would not be less than 25 years. Under the present circumstances 10 years is the limit. 23. I have had no experience of the mode of conducting the business of medical boards, but I have however heard of conflicts of opinion in reference to invaliding. 24. Invalids should leave India for home in February, but never after March.
Diseases.	1. There are no inspection parades at the station for the discovery of incipient diseases. 2. There has been no scorbutus or scorbutic disease at the station. 3. Hepatitis is rare among the men of the Mewar Bheel corps. During 17 years, ending September 1858, there have been admitted 35 cases, of which one died. 4. During the period from September 1841 to September 1858 the proportion of cases of dracunculus has been 1 to 6 men in the year. It appears to be caused by drinking impure water in which the germs abound. Drinkers of pure water never get the disease. 5. There are not more than two or three cases of venereal disease during the year. 6. The troops suffer from the following diseases:— *Fevers.*—Quotidian, tertian, and quartan intermittent, remittent and typhoid of Dr. Jenner. *Dysentery.*—Acute and chronic. *Cholera.*—Sporadic and epidemic. *Small-pox.*—Simple and confluent. *Rheumatism.*—Acute and chronic. The following table gives the proportion of admissions and deaths from these diseases to the total admissions and deaths:—

Diseases.	Proportion of Admissions per cent. to total Admissions.	Proportions per cent. of Deaths to total Deaths.
Fevers	39·75	21·05
Dysentery	1·20	5·26
Cholera	0·56	26·31
*Small-pox	—	—
Rheumatism	2·07	0·75

* Cases of small-pox are generally sent out of the station, and consequently out of the hospital, to avoid the spread of the disease. The disease is very common, though it does not appear so from the returns.

7. The most frequent zymotic diseases are quotidian, tertian, and quartan fevers, remittent and occasionally the typhoid fever of Dr. Jenner. The seasons when such diseases are prevalent will be best shown by the subjoined table, showing the prevalence of malarious fevers for 17 years.

Months and Quarters.	Monthly Per-centage of Admissions to Strength.	Months and Quarters.	Monthly Per-centages of Admissions to Strength.	Months and Quarters.	Monthly Per-centages of Admissions to Strength.	Months and Quarters.	Monthly Per-centages of Admissions to Strength.
17 Septembers	6·709	17 Decembers	5·93	15 Marches	2·59	17 Junes	1·62
17 Octobers	12·760	17 Januarys	3·01	17 Aprils	1·84	17 Julys	2·75
17 Novembers	8·740	16 Februarys	2·55	17 Mays	1·12	17 Augusts	4·00
1st Quarter	9·600	2nd Quarter	3·85	3rd Quarter	1·83	4th Quarter	2·79

7. Their appearance is preceded by the luxuriant vegetation and moist climate of June and July; by the same conditions and much vegetable and animal decay in September and October. In October and November there are still days hot and often oppressive, especially during the former month, with great depression of the thermometer during the night; fogs, &c. The cleanliness of the station, bazaar, and village is wretchedly attended to. The natural drainage is good, but artificial drainage should also be adopted. The supply of water is usually good, but the ventilation of the native dwelling-houses is bad, and they are much overcrowded. The predisposing causes of these diseases among the troops and native population is the want of sufficient personal cleanliness and the absence of adequate clothing.
8. The prevalence of epidemic disease has always been augmented when the duties and exposure

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	have been great, in October and the beginning of November. Heavy, prolonged, fatiguing parades, escort duty through unhealthy parts of the country and night guards, are then very prejudicial to the health of the soldier, whether native or European. 9. Small doses of quinine have not been tried systematically as a prophylactic against malarial disease, except in my own family. During the last four years I have used it in diluted sulphuric acid, in August, September, October, and November, with marked success in preventing the occurrence of malarial disease. The dose must be varied according to the locality. 10. My opinion is, that we shall never arrive at the desired sanitary perfection in Indian military stations until sanitary officers are vested with liberal, responsible, and well-defined executive powers.
V. Intemperance.	1. The Hindostanees are remarkably temperate. The Bheels or Mogiah are habitual arrack or dharoo drinkers, and many of them are confirmed drunkards, but as no record is kept the exact proportion cannot be given. 2. Drunkenness, only when it interferes with duty, is punished as an offence. 3. Distilled spirits, opium, tobacco, chuna, &c. are sold at the bazaar. 4. The consumption of spirits is not conducive to the health of troops, but it is frequently to those convalescing from disease. Spirits are by no means conducive to efficiency and discipline. 5. It would be beneficial to abolish the spirit ration altogether and also the canteens. It would also be advantageous to restrict the sale of spirits in the bazaars. 6. Malt liquors and light wines are exceedingly beneficial when, like every other article of diet, they are taken in moderation. Spirituous liquors are always injurious, except when judiciously employed medicinally, and they then prove invaluable. 7. The influence of coffee, tea, lemonade, and soda-water is very beneficial as compared with spirits. 8 It would be highly conducive to the health of soldiers and convalescents to abolish the spirit ration for ever, and to substitute for it beer, tea, coffee, &c. The allowance of a certain quantity of spirituous liquors to particular convalescents should rest with and be regulated by the medical officer. 9. It would be beneficial in shutting up the canteen, which should never again be recognized as a regimental institution, to make an adequate ration allowance of beer, tea, coffee, lemonade, of the first quality. 10, 11. No reply to these queries.
VI. Diet.	Does not apply to native troops.
VII. Dress, Accoutrements and Duties.	1. No reply to this query.
Duties.	1. Soldiers should be thoroughly instructed in drill at home before being sent to India. 2. The best hours for drills, parades, and marches, are from 4 to 8 a.m., and 5 to 6½ p.m., in the cold season. 3. There are roll calls at day break and sunset, and on emergencies as many more as the commanding officer may find requisite. During the malarious season, night guards are very prejudicial in predisposing to fevers, &c. I think men who have been on night guards, should be excused all drill on the following morning during the drill season.
VIII. Instruction and Recreation.	1, 2. Not applicable to a native corps. 3. The institution of soldiers' savings banks would be advantageous. 4. The lines of the Mewar Bheel corps are well shaded by trees, which are sufficiently removed from each other to admit of the freest ventilation.
IX. Military Prisons.	1. There are no military prisons or cells.
X. Field Service.	1. I am not aware of any local regulations for medical field service not included in the general Presidency regulations. 2. The medical officer has no power to do anything on the line of march of troops bivouacking, camping, &c.; he attends on the sick; he cannot even choose the site of his own hospital. 3. The regulations in camp for the preservation of the health of troops, as to the selection of camping grounds, &c., are very defective. The medical officer has no power whatever; he can write, represent, implore, or refer, but he has no power to enforce improvements by others, or to carry them out himself. The general sanitary state of every station and camp in India should be placed under an executive sanitary officer provided with liberal executive powers, and an efficient fixed establishment. He would act under the deputy inspector-general of hospitals and report to him only, who would report to the principal inspector-general. 4. This query will, I fancy, be fully answered by the central medical authority.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1, 2. The Bheel hospital is within 20 yards of the southern end of the line and to the windward. It stands in much the same relation to the bazaar. The site is freely open, and there are no buildings which interfere with ventilation. The elevation and drainage are naturally good, but the nullah or river is about 30 yards to the windward aspect of it, from which much malaria emanates during the rainy and drying up months. 3. The water supply is abundant, but requires to be boiled or filtered, or both, before using it. 4. There is no artificial drainage round the hospital, the slope being sufficient for the escape of the rain water. All hospital impurities are removed as fast as collected by a professional scavenger, and buried at a distance. 5. There is only one ward to the hospital, which is raised about two feet from the ground; but there is no perflation of air underneath the floor. There is no provision made to carry away the roof water. It partly flows off along the sloping ground surrounding the hospital, the remainder sinks into the subsoil. There is no artificial surface drainage or guttering round the hospital. I think if a system of tile drainage were adopted to carry away the water all round the hospital, it would be a great advantage. The walls of the hospital are built of

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	sun-burnt bricks, with mud in place of mortar; they are single, and the roof consists of a single layer of tiles. Hot air rushes through the interspaces, at the joining of the tiles, and the whole roof radiates much heat by night. The walls are 18 inches thick, and are considered cooling. A verandah 10 feet wide surrounds the hospital on all sides, and affords great protection from the sun's rays. I always keep 32 out of 56 beds in the verandahs for the moderately sick and convalescents. The men prefer the verandahs to the hospital wards. The buildings are one flat.

TABLE of hospital accommodation.

Date of construction, 1841–2.

Total number of wards, 1; total regulation number of beds, 56.

Wards.	Regulation Number of Sick in Ward.	Dimensions of Ward.				Cubic Feet per Bed.	Superficial Area in Feet, per Bed.	Height of Patient's Bed above the Floor.
		Length.	Breadth.	Height.	Cubic Contents.			
		Ft. In.	Ft.	Ft.	Ft.			In.
1	56	70 6	20	13	18,330	327·3	25·1	18

My plan is to keep 32 out of the 56 beds in the verandahs, and the remaining 24 within the Hospital Ward. In this way the cubical allowance of air to each of these 24 beds amounts to 766·2 feet., and the superficial area to about 59 feet.

The hospital faces to the north and south, and its ends are to the east and west. To receive the full benefit of the west and east winds,—the prevailing breezes in fact,—its sides should present to the east and west, and the ends to the north and south. There are no windows, but six doors opposite each other in each side wall and one in each gable wall; in all 14. Each doorway is covered by a jhilmil, and is 7 ft. by 4 ft. The ventilation is by no means bad, and the openings in the tiles assist in perfecting it in a certain way; but the tiled roof makes the hospital very hot during summer.

6. The means of ventilation are the doorways and the openings at the joinings of the tiles of the roof, and these are quite sufficient when the number of men in the ward is kept down to 24; but otherwise, or when the sick exceed this number, the ward becomes foul and close. The jhilmils are made of teakwood painted green, and are in excellent working order.

7, 8. There are no arrangements made either for cooling or warming the air admitted into the hospital. The walls and ceiling of the ward are cleansed and limewashed once a year, and at other times as a sanitary measure on the recommendation of the medical officer.

9. The privy of the hospital is made of sunburnt bricks. It is a small place with four latrines in it, and is kept thoroughly clean by repeated scouring out. There are no cesspits, but the ordure and urine are collected in earthenware vessels placed in and fitting into the latrines, and promptly removed by the mhaiter, to be buried at a distance from the hospital. The privy is seldom or never offensive; but charcoal is in constant use in it, and with the best result.

10. Each patient in a native corps makes his own lavatory arrangement, or has them made for him by his friends. It would, I think, be a good plan, if to every native hospital a proper bath-room, &c. were attached.

11. Each patient defers bathing, according to custom, till he is cured, when he retires to the nearest well, draws water, and in the proximity undergoes the bath of cure. It is a bad custom, and perhaps if to each native hospital a good bath-room were attached, bathing might be enforced whenever deemed necessary by the surgeon.

12. The only means of washing and drying the linen in a native regiment are the caste comrades of the patients, or when not very seriously prostrated, by the patients themselves.

13. The storage is sufficient and dry.

14. The bedsteads, charpoys, or cots, are constructed of teakwood. They measure 6 ft. 4 in. in length, 2 ft. 10 in. in breadth, and 14 inches in height, and are bottomed with broad substantial cotton (country made) tape. Each sepoy provides his own bedding, and the plan answers well; the surgeon insists on each man bringing as much as may in his judgment be necessary.

15. The hospital kitchen is a small building about 10 ft. wide, by 20 ft. in length, with a tiled roof; but the men often prefer getting their friends to cook their food outside, under the nearest tree. In fact, the kitchen is chiefly employed for the preparation of hot water (always in readiness), poultices, &c.

16. There are no diet tables or diet rolls in use at this station.

17. Dooley bearers are much employed to wait upon the sick, but this duty cannot be exacted from this class of servants by any regulation. The attendance may or may not therefore be so good as is desirable. Helps are granted in extreme cases on the application of the surgeon in medical charge of the corps, who will be held responsible that the men allowed to administer to the wants of their comrades in hospital, shall not be longer detained from their lines and duties than shall be absolutely necessary. In this way the attendance may always be made sufficient.

18. The sanitary condition of my hospital is good, but it is only rendered so by an unremitting self-sustaining, and permanent system of practical sanitation. The existence of an underground plan of tile, rubble, or stone drainage for some distance round to carry off that portion of the rain fall which sinks into the subsoil would be a manifest improvement. During the past two years, gangrenous and spreading sores have been frequent from the overcrowding of many cases of sores into too confined a space.

19. I think the tiled roofs should be double, with a foot of space intervening between them, or between each layer of tiles.

20. There are no special provisions for the exercise of convalescents, neither are there any seats or shaded walks; but, last rains I, at my own expense, planted trees all round the hospital, well apart from each other. Each tree is being trained with a long shaft or trunk, so that whilst there will be abundance of shade, the perflation of air will be facilitated. The arrangement is very popular with the men.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	21. The sick wives and families attached to this regiment are always treated at their own quarters. The present arrangements of the hospital answer very well upon the whole. 22. I am not aware of any written special hospital regulations, except the following :— The surgeon cannot recommend line leave to convalescents over four days, which may, however, at his recommendation, be extended. He may recommend men discharged from hospital four days light duties, but no more. The consequence is men are often detained in hospital when they might be doing some slight service to the State. 23. Beyond a controlling influence over his own hospital establishment, the medical officer has no powers. Repairs are executed on his recommendation by the engineer authorities. In a native corps in which every man finds his own food, the medical officer can have but little influence over the diet; but he can administer any medical comforts he chooses, and charge for them in quarterly contingent bills. 24. There are no wards or hospital for convalescents at this station, but I think it would be highly advantageous to the British soldier to have that accommodation, with well shaded walks and seats attached.
XIII. Burial of the Dead.	1, 2. There is a small graveyard for Europeans here, situated to the leeward aspect of the camp; but in 19 years there have been only three burials in it. It measures 40 feet × 20 feet, and the subsoil consists of gravel and kunkur. It is not carefully attended to. I fancy that decomposition takes place pretty rapidly. There is no artificial drainage. 3. The three tombs in our graveyard are fully eight feet apart. I do not think there is any forced rule as to the grave space allowed here, although there must be where European troops are quartered. The depth of each grave is seven feet, and they are never re-opened. There is one body to each grave. Interment at ordinary times takes place, if possible, on the day of death, but during epidemics without delay. There is no burial ground for native troops at Kherwarrah. 4. No data. 5. The dead of bazaar people are generally burnt; but if the deceased be a Mussulman, he is buried. 6. I think those natives who bury their dead do so most imperfectly. The graves are too shallow, and often surround wells used by the population. 7. All graveyards should be situated fully three-quarters of a mile to the leeward side of the camp, and be well drained on every side. The men should be buried as soon after decease as possible, and fully eight feet below the surface. More than one body should not be crammed into one grave till it has been made certain that the body previously deposited there has been completely destroyed by decomposition.

June 26th, 1860.

(Signed) Joseph Ewart, M.D.

APPENDIX.

A Suggestion.

The introduction of a permanent and unintermitting system of sanitary reform into our Indian military stations, is an imperative state necessity. To accomplish this great desideratum successfully and economically, sanitary officers should be vested with executive and responsible functions. The officers, who are best qualified by life-long association with disease, to discover instinctively its sources, should be empowered to eradicate or mitigate them, according to the acknowledged principles and common sense dictates of sanitary science. To entrust, as is done at present, the execution of sanitary improvements to untrained and unqualified persons, who, judging from the experience of the past, cannot appreciate or understand their vital importance, is just as unwise and dangerous to all the dearest interests of the soldier and his family, as it would be supremely unphilosophical and unsafe to confide to untaught hands and inexperienced brains the control, management, and cure of the developed diseases from which they suffer. As it has been found absolutely necessary to vest the physician with full powers and responsibility as regards the treatment of disease, so will it, it is earnestly hoped, at no distant date be found essential, both for the welfare of the soldier and for the attainment of the greatest possible physical and military efficiency of the army, to confer plenary powers upon sanitary officers to enable them to wage a successful war against death's latent and rampant legions, and also to fix upon them complete responsibility. I beg, therefore, most respectfully to recommend for favourable consideration—

1. That there be appointed an executive sanitary officer at every station, great and small, of the Indian army.

2. That the executive sanitary officer be appointed by selection, on the recommendation of the deputy inspector general of hospitals.

3. That the executive sanitary officer be directly subordinate to the deputy inspector general of hospitals, to whom he would make periodical reports.

4. That the present scavenging and conservancy establishments of stations and camps be re-organized, according to a minimum scale, to be approved by administrative medical officers, and transferred to executive sanitary officers.

5. That every executive sanitary officer be vested with full directorial powers over his sanitary establishment.

6. That a concise code of rules be drawn up, specifying in definite terms, the duties, position, responsibilities, relations to other departments, and staff allowances of the executive sanitary officer.

7. That these regulations be framed in a liberal spirit, so as to enable the executive sanitary officer to keep up a continuous and progressive system of sanitary improvement throughout his jurisdiction.

8. That the duties of the executive sanitary officer be so clearly expressed and defined as to render collisions with other authorities and departments an impossibility, and to fix on him alone the entire responsibility for the sanitary excellence of his station or camp.

Joseph Ewart, M.D.
In medical charge,
Mewar Bheel corps,
Kherwarrah.

31st May 1860.

DERA GHAZEE KHAN. BENGAL.

DERA GHAZEE KHAN.

Accommodation.—Native Troops — — — { Cavalry, 4th Punjab. Infantry, 3rd Punjab.

Reference to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is well cultivated and covered with date palms, but flat and dry, unless where irrigated by canals. The vicinity of the station is thickly covered with date palms and other jungle, and is irrigated in all directions by canals from the river Indus. 2. The station is elevated above 200 feet above the level of the sea; but is on a level with the surrounding country. There is no higher or healthier ground adjoining the station. 3. The nearest mountains are the Sooliman range, at a distance of about 40 miles west. The highest elevation of this range is about 7,000 feet above the sea level. 4. The river Indus is within three miles of the station, and the cantonments are intersected by nullahs from the canals. The vicinity is inundated annually by the Indus, from July to September. There is a little broken ground to the rear of the cantonments where water is apt to accumulate and stagnate, but no known evil effects arise from it. 5. In parts of the station date trees are very thick, but the station generally is well exposed to the winds. The temperature of the station is not raised by the buildings being exposed to reflected sun heat. The station is not exposed to cold or variable winds, or to land or sea breezes. 6. The surrounding country is cultivated, and all around as well as in cantonments is irrigated by canals; but there is no injury to health from this irrigation that I am aware of. There is no cultivation of rice; but indigo is one of the commonest crops of the district, and is grown and prepared all round the station. It has no apparent bad influence on health. 7. The town of Dera Ghazee Khan is within a mile of the station. 8. The surface soil of the station, to the depth of 4 feet, is alluvial, with a subsoil of sand, below which occurs a stratum of yellow clay, about 1½ feet thick, followed again by sand or gravel. The station occupies new ground. 9. Water is usually found at a depth of 8 feet below the surface in the dry, and of 4 feet during the rainy season. 10. The rain fall and surface water sink into the pervious subsoil or remain in hollows till dried up by the sun and wind. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived from wells and canals. There are no tanks. 12. The water supply is unlimited, and the water clear, colourless, soft, and free of all taste or smell. When filtered it is clear and soft, almost identical with the water of the river Indus, from which in fact it percolates, except in some of the wells, where it is more or less impregnated with salts of potash and soda, which abound in some parts of the soil. The water is raised by means of Persian wheels, and no better supply could be obtained or desired. 13. The inundation of the Indus, which in 1856 rose so high as completely to swamp the whole cantonment, is always a point to be considered in relation to Dera Ghazee Khan as a station for troops. During that year the entire station was prostrated by fevers and their results; but such a rise in the river however is not common. 14. The mode of selecting sites for new stations is as follows. A site having been indicated by the Brigadier-General commanding, it is visited by the officer commanding the station, the executive engineer, and a medical officer, each of whom sends in a separate report as to its fitness or unfitness.
II. Climate.	1. The only meteorological instruments at this station are a common thermometer, and a rain gauge. 2. No trustworthy meteorological records have been kept at this station. 3. As a rule very little rain falls in the district, and the climate may be said to be dry, though the air is always more or less charged with moisture from the proximity of canals, irrigated fields, and the river Indus. For the same reason also the temperature is lower, and the air freer from dust than in other parts of the district beyond the influence of the cultivation. The troops are generally healthy, unless after unusually high inundations, or heavy falls of rain. Warm clothing for native troops is necessary from the end of October to March. The most unhealthy months are those succeeding the inundations, viz., August, September, October, and part of November, and the prevailing diseases during these months are chiefly intermittent fevers and dysentery. 4. Any district beyond the reach of the inundation would in all probability be more healthy than this, but for military reasons the station could not be removed far from the city of Dera Ghazee Khan. 5. I have served at Mean Meer, Bunnoo, Nowshera, Rawul Pindi, Asurr, and Dera Ghazee Khan, besides in many others, but not for a sufficient length of time to enable me to judge as to their effect on the health of troops. Of the above Rawul Pindi was assuredly the most conducive to health; Mean Meer, Bunnoo, and Nowshera by no means unhealthy, but Asurr and Dera Ghazee Khan decidedly prejudicial,—the former from want of vegetables and bad water, and the latter from the inundation. In 1856, when a great inundation occurred at Dera Ghazee Khan, scarcely a man in the station, either European or native, escaped fever and enlarged spleen.
III. Sanitary Condition of Station.	1, 2, 3, 4. There are no barracks, guard-rooms, or military prisons at Dera Ghazee Khan. 5 to 10. No answers to these queries. 11. Any repairs necessary to the cantonments are effected by the executive engineer. The officer commanding the station is responsible for the general sanitary condition of the cantonments, certain funds, raised from lands cultivated within their limits, being appropriated for conservancy purposes by him. 12. No answer to this question. 13. The conveniences for washing and drying the linen of the station are ample. 14, 15. There are no privies or urinals at this station. 16, 17. There are no foul ditches near the station. There appear to be no arrangements whatever for the conservancy of the cantonment and its vicinity.

Reference to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	18. The surface of the cantonment is by no means kept free of vegetation; there is a considerable quantity of uncut jungle which is used as a resort by the Sepoys and bazaar people which might with great advantage be removed, and which, I am glad to see, has recently been begun. 19. There is no drainage, neither are there any latrines in the bazaar, but sweepers are employed to keep the bazaar clean. There is only a regimental bazaar in cantonments. There are no native houses nearer than those in the city, which is in a very filthy state. The streets are drained and kept clean by a number of sweepers, paid from the municipal funds; but there are no public privies, and all unoccupied pieces of ground and ruined houses are consequently sinks of filth. No nuisance is experienced from wind blowing over the native dwellings. 20, 21. No replies to these questions. 22. The irregular cavalry have no stables, the horses of each troop being picketed down the centre of the men's lines. The dung is regularly removed by sweepers and deposited in a heap at a distance from the lines, where it is either burnt, removed by the town's people for burning bricks, or used for littering roads. 23. No answer to this query.
Officers' Quarters.	1. Officers at this station live in detached bungalows.
IV. Health of the Troops.	1. The troops at the station and the adjoining native population are, on the whole, healthy. 2. Small-pox is of frequent occurrence, and intermittent fevers, with enlarged spleen, prevail to a large extent after the annual inundation. 3. The general healthiness of the neighbouring population is owing, in all probability, to the dryness of the country, and freedom from jungle beyond the reach of the inundation, it being only within the influence of the latter that intermittent fevers and spleen are common. 4. The 3rd Punjab Infantry, which had been stationed at Kohat, on this frontier, for eight years, left it for Dera Ghazee Khan on 17th December 1859. The health of the men was bad till the last year of their stay there, endemic and adynamic fevers, and chest affections being always very prevalent there. They arrived here in January 1860, and their health since leaving Kohat has been good. The 4th Punjab cavalry was stationed at Asurr, on the borders of Sinde, for nearly three years, and left for the station on the 24th March 1860. While at Asurr their health was very indifferent from the prevalence of scorbutic diseases. They arrived here on the 30th March 1860, and since then their health has been excellent. There is no difference as to healthiness in different parts of the present cantonment. 5. There is no such arrangement as camping out the troops for a certain time every year at this station; but there can be no doubt that, when on the march, the health of both officers and men is much better than when stationary in cantonments. 6. I have never been in charge of troops at hill stations. 7 to 16. No experience of hill stations. 17. There is no higher ground within our own territory which could be advantageously occupied as a hill station. 18. I cannot say I have remarked that any particular class of surface and subsoil is more healthy than another for stations. 19 to 24. No experience to enable me to answer these questions.
Diseases.	1. There are no regular inspection parades for the discovery of incipient diseases at this station. 2. There has been no scorbutus here. 3. Hepatic disease is of rare occurrence among the native troops at this station. 4. Cases of dracunculus are rare here. 5. The admissions for venereal disease do not form more than 2½ per cent. of the total admissions. 6. Intermittent fevers, dysentery, small-pox and rheumatism are common at this station, but cholera has never been known to prevail here. About one-third of all admissions during the past year has been from the above diseases, and about two-thirds of the deaths. 7. 8. No reply to these queries. 9. Small doses of quinine have not been given at this station as a prophylactic against malarial disease. 10. No reply to this query.
V. Intemperance.	1, 2. The only class who drink spirituous liquors among the native troops here are the Sikhs, and they rarely carry their potations to the extent of drunkenness. There are no confirmed drunkards, nor any admissions into hospital from diseases caused either directly or indirectly from intemperance. 3 to 11. No replies to these questions.
IX. Military Prisons.	1. There is no military prison at Dera Ghazee Khan.
X. Field Service.	1, 2. No answer to these questions. 3. Water being frequently scarce and bad on the Trans-Indus frontier, each native infantry soldier is supplied with a tin or copper canteen, which he carries on the march, slung over his shoulder by a strap, and filled with water. Besides this there is a bheestie attached to each company, who is provided with a bullock and "pukaul," or large skin, for the conveyance of water on the march. The irregular cavalry sowars have each a small "mussuck," or skin, which they carry filled with water and tied under the bellies of their horses. 4. For the transport of sick and wounded in the Punjab irregular force, one dooly and six bearers are allowed for each troop or company, and these are permanently attached to the regiment. One pair of light "kujawas," carried on a camel, is also allowed each troop or company on service; and as expeditions into the hills are frequent on this frontier, when the common dooly is of little use for the transport of sick and wounded, Government has also recently provided each regiment with what is termed a "dandy," to be carried on the top of each "dooly." This consists of a piece of strong "dhurrie" cloth, with a bar or iron stretcher at each end, which can be fastened on the pole of the dooly and used where the dooly itself could not be carried.

(Signed) C. J. Godby, Captain,
Commanding 4th Punjab Cavalry.
D. Kirwan, Assistant Engineer,
Superintendent Indus Canals.
James Fairweather, M.D.,
Assistant-Surgeon, 4th Punjab Cavalry.

25th October 1860.

LOODIANA.
BENGAL.

LOODIANA.

Accommodation - { Native Troops - { Military Police, Cavalry - 1 Troop.
Present Occupation { " Infantry - 1½ Companies.

References to Subjects and Queries.	Replies.
I. Topography.	1. Towards the south of the station are extensive sandy plains under cultivation by cereals. Towards the north, the land gradually sloping towards the old bed of the river Sutlej, is better and more richly cultivated. The country is flat, sandy, and dry. There is no jungle, and very little wood or water. 2. The elevation of the station above the sea is about 900 feet, and is on a level with the adjacent country. It is about 19 or 20 feet above the nearest water. There is no perceptible high ground in the neighbourhood, and I am not aware of any objection to the present site of the station on the ground of unhealthiness, as compared with the surrounding country. 3. The nearest mountains are the Himalayan range, which lie about 70 miles north-east of the station. 4. A nullah runs about a quarter of a mile from the station, and flows into the river Sutlej, which is about five miles distant. The nullah becomes extended from the size of a brook to about 300 yards of shallow water, at the same time that the bed of the Sutlej (which at other seasons consists of a great extent of sand intersected by several streams) is filled by the melting of the snow in the hills, and by the floods caused by the heavy rains which fall in July, August, and September. The overflow seldom lasts more than a few days at a time. There are several dry nullahs about the station. They are natural surface drains, and carry off the rain-fall from the surrounding country into the nullah, and thence into the river Sutlej. They are conducive to the health of the station by keeping the land free from the lodgment of water. 5. The station is open, and freely exposed to winds, and there are no obstructions to the free circulation of air. The temperature is not raised by reflected sun heat. The station is exposed sometimes to hot land winds from the west, but most frequently from the east. They are exceedingly enervating, but do not produce generally any other bad effect upon health, except by causing ophthalmia among those exposed to them. 6. The surrounding country is cultivated. There are no works of irrigation near the station. Neither rice nor indigo are cultivated in the neighbourhood, and there is no preparation of hemp or flax carried on near the station. 7. The town of Loodiana, the population of which is about 50,000, adjoins the station. 8. The geological structure of the district is partly sand and partly clay, with a stratum of kunker here and there, on an average three feet below the surface. The ground which the station occupies was not previously occupied by population. 9. Water is usually found about 32 feet below the surface in the dry season, and during the rains about 28 feet. 10. The soil being very light and sandy, water is easily absorbed, and the surplus is readily carried away by nullahs. There are no surface springs. There is no adjacent high ground, the drainage from which passes into the subsoil of the station. 11. The water supply is entirely from wells. There are no tanks in the station or near it, and the wells are kept free from impurities of all kinds. 12. The water supply is plentiful, the water colourless, tasteless, and free from smell. It is hard, the quality is excellent, and the amount sufficient. It is raised from the wells by means of leather bags, and distributed by water carriers. The supply amply meets the wants of the people. 13 and 14. No reply.
II. Climate.	1. The only instrument for conducting meteorological observations is a rain gauge. 3. The climate is very dry, and the heat very great from April to October. The seasons are tolerably regular, but there is not unfrequently a deficiency of rain. In the cold season the nights are cold, and it sometimes freezes to a slight extent. Fogs are rare. The climate is uninfluenced by tree-planting or by well irrigation. During the hot season the air is frequently laden with dust and small sand. The police force, being composed of natives, are unaffected by the climate. The most healthy months for Europeans are from November to April; the most unhealthy are August, September, and October. For natives the most unhealthy are from August to January. The prevailing diseases during the unhealthy months are intermittent and remittent fevers, spleen, dysentery, and diarrhœa. 4. I know of no adjacent district the climate of which is more conducive to health than that of the station. 5. The stations on which I have served are Calcutta, Rangoon, Thyet Myo, Meeaday, and Loodiana. The climate of Calcutta is, I think, the most relaxing of all these. Rangoon, at the time I was stationed there, in 1853, was surrounded by jungle and swamp, so that sickness, particularly dysentery, prevailed there to a much greater extent than I believe it to do now. The same with regard to Thyet Myo and Meeaday, in Burmah, each situated upon the high bank of the river Irrawaddy. They both seemed likely to make good and comparatively healthy stations when cleared of jungle and supplied with good barrack accommodation. Loodiana, in common with most other stations in India, has its healthy and unhealthy seasons and years. Fever, spleen, and dysentery in some years prevail very extensively among the inhabitants both of the station and district, and I believe it was not found to be a healthy station for European troops. The climate, generally speaking, seems to be equal to that of the majority of the stations in the plains of the Punjab.
III. Sanitary Condition of Station.	1, 2, and 3. The executive engineer states that he has no plan which would give the information required, and without the sanction of Government, could not obtain the requisite assistance for enabling him to make one. Loodiana, formerly a large military station, is now only a civil one. The buildings which composed the old station have all been demolished, except the hospital and the houses required by the civil officers

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	now resident in the station. There are no cantonments; the military police are only in force sufficient for the various guards. The hospital is for the reception of the sick amongst the military police, as well as for any sepoys who may fall ill while marching through the station, or for any who may require medical treatment when sick on leave away from their regiments. In addition to this hospital, there is, in the outskirts of the town, a Government dispensary for the treatment of the sick of the district, with accommodation and hospital establishment for in-patients, male and female. The annual attendance of out-patients is about 6,000 or 7,000. In-patients admitted, 250 to 300. There are no barracks, military prisons, or bazaars. The only public buildings besides those above mentioned are the magistrates' offices and the jail; the latter is about a mile from the station. There are no water tanks, jheels, rivers, or canals. The station being nearly 20 feet above the nullah adjoining, the land is drained by means of natural watercourses. There are no cesspits, dunghills, &c., and the station is kept clean by means of scavengers, and all offensive matters buried. The conservancy arrangements are under the supervision of the Deputy Commissioners, the engineer, and medical officers. 4. Table not filled up. 5 to 23. No replies.
Officers' Quarters.	1. No replies.
IV. Health of the Troops.	1. The native population of the station and district are, generally speaking, a healthy race; there is, however, much sickness among them after the rains. 2. The most prevalent diseases are intermittent fever, spleen, dysentery, rheumatism, ophthalmia, and scurvy. 3. Most kinds of food used by natives are cheap in this district, as it is agricultural and not very thickly populated. The inhabitants, chiefly Sikhs and Mussulmans, are without any very strict prejudices with regard to food, and this would account for their being, generally speaking, healthy. Fever is annually epidemic after the rains, owing to malarious exhalations. It is very frequently followed by enlargement and softening of the spleen, and also by dysentery. Dysentery, I have no doubt, is more frequently produced by malaria than from any other cause. Ophthalmia is occasioned by the heat and glare of the sun as well as by the fine sand with which the atmosphere is often laden. Scurvy to a greater or less extent is common among the class of people who live on the same kind of food for years together. Many of the poorer classes subsist entirely upon bread and pulse. 4. The police at this station are relieved every few months from their head quarters at Umballah. They have always been in good health on their arrival, and there has been but little sickness among them here hitherto. Good accommodation is provided for the men at the different guards, and none of the situations have proved unhealthy. 5. No reply. 6. I have never resided in the hills in India. 7 to 16. No replies. 17. There is no higher ground near the station which could be advantageously occupied. 18. No reply. 19. Soldiers should not proceed to India until they have attained their full growth, and the best period for arriving is during the cold season, from October to February. As a precaution for preserving health, on first landing, recruits should not be allowed to expose themselves to the sun more than is absolutely necessary; they should be provided with a good, and at the same time light covering for the head, their clothes should not be tight, and they should be prevented from drinking to excess. 20. As far as I have observed, I think that a European fresh from home arriving in this country in the cool part of the year would bear the climate better than one who had spent some time at an intermediate station. I think it is probable that the lives of many recruits might be saved by their being sent to hill stations, and so becoming gradually acclimated before being stationed in the plains, as it is almost impossible, on their arrival, to make them take proper precautions against exposure to the sun. 21. No reply. 22. Most Europeans require a change of climate for a time after 8, or at most 10 years' service in India. 23. No reply. 24. January, February, and March would be the best months for invalids to leave India, so as to enable them to arrive at home in the spring or summer.
Diseases.	1. There are no inspection parades for the discovery of disease. The men are all on duty, and come to hospital readily when ill. 2. I have met with no scorbutic cases amongst the police. They are common enough in the district. I believe it to be occasioned among the natives by their eating the same kind of food for years. Those who vary their diet are not subject to the disease. 3. There is but little hepatic disease among the natives here, probably owing to the unstimulating nature of their food, it being composed chiefly of vegetables. They also generally wear folds of cloth round their waists to keep off diarrhœa. I think the heat of the climate alone in many European constitutions produces hepatic disease, and that the prophylactic measures should be those ordinarily taken to preserve health, and to avoid undue exposure to the heat of the sun. 4. Dracunculus is rarely met with in this district, and no cases have been treated in the military hospital. 5. The proportion of the sick from venereal diseases to the total number of sick treated last year at the military hospital was 16·2 per cent. The hospital accommodation at this station has been sufficient for the proper treatment of these diseases. 6. The epidemic diseases at the station are as follow:—Intermittent fever, generally quotidian, was treated at the military hospital last year to the extent of 24·8 per cent. on the total number of sick; remittent fever 3·3 per cent.; acute dysentery

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	5·4 per cent. Epidemic cholera has not prevailed here for many years. Cases of sporadic cholera have occurred occasionally in the military hospital, and have generally yielded to treatment. No case of small-pox was treated in the hospital last year. Rheumatic diseases were treated to the extent of 9·2 per cent. on the total number of sick. The only death that occurred from any of these diseases last year was one from remittent fever. 7. The only infectious disease prevalent here is "variola." It appears annually among the native population of the town and district, but very rarely occurs in the station. It prevails at the beginning of the hot season, during the months of April, May, and June, and begins to disappear on the commencement of the rains. Beyond an increase of heat no peculiar climatic or atmospheric conditions have been observed to accompany the appearance of this disease. It is not confined to any particular spot, as cases occur in the towns and villages throughout the district. All classes of the people seem to be equally subject to it. Until the introduction of vaccination scarcely a person escaped the infection. As far as my experience goes most native soldiers have had the small-pox before enlisting, generally during childhood. 8. Exposure to the sun, fatigue, and lying on the, perhaps damp, ground on the march, would render the soldier more liable to the influence of epidemic disease than another not similarly exposed; but in the station, generally speaking, the soldier does not suffer more than others. 9. Many persons subject to fever are in the habit of taking quinine in small doses daily during the fever season. There can be no doubt of the protective power of quinine so taken. 10. I think that in European regiments the practice of giving small doses of quinine as a prophylactic during the prevalence of fever to soldiers peculiarly liable to suffer from the disease would be beneficial. With regard to small-pox, the extent to which the disease prevails has been very much diminished since vaccination was introduced into the district, and we can hardly expect to see a greater reduction in the amount of the disease unless vaccination be made compulsory.
XII. HOSPITALS.	1. Plan. 2. There are no barracks in the station. The hospital is three-quarters of a mile from any bazaar, but is near the houses of the civil population. The site is open and freely ventilated, and there are no buildings or trees which interfere with ventilation. The site of the hospital is on a level with the rest of the station; the drainage is by means of open gutters falling into a nullah a quarter of a mile off. There is no malaria or nuisance near it. 3. The water supply is abundant and wholesome. 4. The water is carried off from the neighbourhood of the hospital by means of open natural surface drains. All impurities are removed by sweepers. 5. There is but one ground-floor ward, on a level with the adjoining land, or but little above it; the floor is bricked. Gutters are provided for carrying off the water from the roof. Gutters run on the north and south sides of the hospital; these unite on the east, about 100 yards in front of the building, and flow into a nullah a quarter of a mile off. The hospital is built of burnt bricks, cemented together with a mixture of lime and burnt clay. The roofs and walls are single, but are sufficiently thick to keep the hospital cool. There is an enclosed verandah all round the building. When the accommodation afforded by the wards has been insufficient for the number of sick the verandahs have been used, but it has not often been necessary. The hospital consists of only one flat. It is placed so as to receive the full benefit of the prevailing winds. It is well ventilated. 6. Windows and skylights are used for ventilation, and are quite sufficient. There are no jalousies or jhilmils. 7. No reply. 8. The walls and ceilings are cleansed and limewashed whenever required. 9 to 12. No replies. 13. The storage is dry and sufficient. 14 to 16. No replies. 17. The provision for attendance on the sick consists of one native doctor, one coely, one water carrier, one sweeper. These meet the ordinary wants of the sick. 18. The hospital is an old spacious airy building, very well adapted for native troops. No epidemic disease, hospital gangrene, or pyæmia have appeared in the ward. 19 and 20. No replies. 21. The present arrangements for the sick wives and children of soldiers meet the requirements of the station. 22. No reply. 23. The medical officer can get sanitary defects remedied and repairs to the hospital made, by requisition to the Deputy Commissioner of the district. 24. Convalescent wards are not required for native troops.
XIII. BURIAL OF THE DEAD.	1 to 7. No replies.

(Signed) W. B. RRETT, Assistant Surgeon in Medical Charge, Loodiana.

P. C. ANDERSON, Executive Engineer, 8th Division, G. T. Road.

May 1860.

MADRAS PRESIDENCY.

FORT ST. GEORGE.

Accommodation — European Troops — Artillery - - - 33; Infantry - - - 1,030
Native Troops — Cavalry Body Guard - 100 (find their own accommodation).
Infantry - - - 841 at Perambore. Remainder variable and not fixed.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is flat in many places; sandy and dry in the dry season, but in the rainy season it is not swampy. There is not much wood; no jungle; water in abundance, except during the dry season. 2. The station is almost on the level of the sea. The sea is on the east. The river Cooam nearly surrounds the fort and town of Madras, and there is a continuation of tanks on the outskirts of the suburbs. There is no neighbouring ground higher and healthier combined adjoining the station. 3. The nearest higher ground is at Palmoraire, on a spur of the Mysore range, about 2,200 feet above the sea and station, and distant from Madras 120 miles; but it is said to be feverish. With the facilities of rail and transit, the Neilgherries are preferable for sanitary purposes. 4. Station is on the sea shore. The vicinity of the station is not liable to overflow of water, except on rare occasions, during the monsoon, and it rapidly subsides. There is no broken ground, ravines, or water pits near the station. 5. The station is open and freely exposed to winds. The surrounding country is open and flat. No impediments to free external ventilation. The barracks for Europeans are in Fort St. George on the seaboard. The lines of the native body-guard are open; those for the native infantry are in the districts of Perambore, Vepery, and Royapooram. Perambore lines are open, and possess free ventilation. Vepery are more enclosed, but not so much as to interfere with ventilation; Royapooram is merely occupied temporarily. It may be remarked, that native houses in general are very deficient in internal ventilation. The temperature of the station is not raised to any appreciable degree by reflected sun heat. The station is not exposed to cold winds. Winds are variable in May, June, July, August, and September. Land winds blow in May, June, and July, during the greater part of the night and early part of the day, succeeded by the sea breeze. During the remainder of the year the sea breeze is steady till March, when the long-shore wind sets in till May, during the greater part of the day; the land wind setting in during the night. The sea breeze is favourable to health. Fevers, catarrhs, and rheumatism are, generally speaking, common during the long-shore winds; but it does not appear that they are traceable to this cause, or that there is anything detrimental to health in any of the winds prevalent here. 6. The country around is cultivated. It is irrigated by large tanks on the outside limits of the town, but these are dry at the season previous to the periodical rains. The artificial irrigation is not observed to have any influence, beneficial or otherwise, on health. There is no prohibition against the cultivation of rice near the station. Indigo is not cultivated, nor are hemp nor flax prepared near the station. 7. The troops are stationed in the large town of Madras, containing a population of upwards of 700,000. This must be borne in mind when referring to the troops, with the exception of the Europeans stationed in Fort St. George, which is isolated from the town by a glacis and esplanade. 8. The surface formations are sand and clay. Primitive formation about 100 feet below the surface. The troops occupy ground formerly and still occupied by a numerous native population, except the European troops, who are stationed in the Fort formerly built for the protection of the factory of the East India Company. 9. Water is usually found from 16 to 20 feet below the surface in the dry season, and near the surface in the rainy season. 10. The rain water generally sinks into the subsoil, but it also partially drains off and what remains on the surface rapidly evaporates. There is no higher ground, the drainage of which passes into the subsoil of the station. The elevation is so slight, that it partially drains the surface, and the water is then collected into large tanks used for irrigation, and also flows into the river Cooam. 11. The water supply is derived from the "Seven wells," distant two miles, and conveyed to the Fort by water pipes. It is stored in the Fort in large covered cisterns. It is not stored in the native lines, but the troops there use the tanks and wells resorted to by the native population. The tanks are dry in the months of May, June, and July, unless there is rain abundant enough to fill them. Various species of fresh-water *algæ* are found in the tanks, besides numerous specimens of *diatomacea* and *desmidacea*. Some species of fish and crustaceans exist in the larger tanks, and in all of them batrachians are plentiful. *Acalephæ*, &c. abound in some of the tanks, more especially in the Fort ditch, and when the water is low, a most offensive odour is emitted. No tank used for drinking water is allowed for bathing in by European troops. Native troops are generally particular as to the water they drink, especially those of higher castes. The tanks are not liable to pollution from leaves or other extraneous matters. There is no evidence of distinct malaria proceeding from any of the tanks, but nuisances in the shape of most offensive effluvia are abundant, especially in the river Cooam, supplied by the sea, the banks of which are mud; but it does not appear that beyond the offensive odour, any ill consequences to health result from the nuisance. It is difficult to trace how far the effluvia may predispose to disease, but in all probability, those who reside on the banks are more liable to suffer from malarious diseases, than others not exposed to its influence. Probably "Dale's muriate of iron" would be the best deodorizing agent as a preventive. 12. There is an abundant water supply drawn from various wells and tanks. Some of the water is brackish, especially that from the wells in Black town, whilst that drawn from other sources is tolerably pure. The water from "Seven wells," which is that supplied to the Fort, is very pure and sweet, perfectly pellucid, of good taste, and free from odour. Other wells afford equally pure water. Almost all tank water has a disagreeable smell, probably due to the presence of *characeæ*, whilst the taste is rank or mawkish. Tank

P 2 FORT ST. GEORGE. MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	water is especially liable to be impregnated with impurities in consequence of buffaloes and other cattle being washed therein, or basking in the water during the heat of the day. There is no peculiar hardness about the well water except that which has already been mentioned as brackish, and no impurities can be detected under the microscope. Generally speaking the quality is good and in no respect injurious to health, and the amount is abundant. For the Fort no better supply could be obtained. (Means of distribution not stated.) 13. There is no other topographical point requiring notice beyond the fact that the station is bounded on the east by the sea, which here presents a completely open roadstead without harbour of any kind. 14. New stations are generally selected by the officer commanding the division in which the intended station may be situated. The medical officer nearest the spot is desired to report on the eligibility of the proposed site, his attention being particularly directed to topographical circumstances, character of soil, openness and exposure to winds, freedom from marshes and malaria, climate, diseases endemic among the surrounding population, prevalence of epidemics, means of natural drainage, facilities for forming parade and exercising grounds, and for erecting barracks, lines, &c., with due reference to sanitary requirements, and the character of the surrounding country. The assistant quartermaster-general of division generally makes a report also, and the final decision rests with the General, who visits the spot accompanied by his staff, and generally by the divisional head of the medical department. Hill stations are generally chosen when sanitaria are desired, but on ordinary occasions stations are selected on the plains. It does not always happen that the recommendations of medical officers are attended to; private interests sometimes interfering with the selection of what they consider the best site. It might be probably advisable that the power of selection should be vested in a committee composed of seven members, three of whom should be medical, and one an officer of engineers; the majority to decide on the final recommendation to government.*
II. CLIMATE.	1. There is a government observatory at Madras, under the charge of a government astronomer. 2. The following table, prepared by Mr. Taylor, formerly government astronomer at Madras, is an average for any number of years, although extending only from 1811 to 1841, and has been furnished by Major Worster, acting government astronomer:—

Months.	Days.	Barometer Mean Height.	Thermometer Mean Daily Temperature.	Extreme Maximum.	Extreme Minimum.	Mean Dry.	Mean Wet.	Mean Sun Temperature.	Rain.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Dew, Winds, &c.
		Inches.	°	°	°				Inches.				
Jan.	1 to 10	30·115	75·3	86·0	65·0	—	—	—	0·55	N.E., E. Sea breeze.	Steady	20	Sea breeze sets in middle of day. Dews. Fogs 2 feet above ground. Weather serene, perhaps a single light shower. Lightning almost unknown.
	10 „ 20	30·110	75·5						0·53				
	20 „ 31	30·090	75·9						0·11				
Feb.	1 „ 10	30·085	76·8	87·0	66·0	—	—	—	0·03	N.E., S.E. Sea breeze.	Calm till 11 a.m. moderate.	28	Sea breeze at about 11 a.m. till sunset, calm and clear. Considered the most healthy period of the year. Rain and lightning not once in 7 years.
	10 „ 20	30·084	77·8						0·00				
	20 „ 28	30·070	78·5						0·01				
Mar.	1 „ 10	30·042	79·8	90·2	68·7	—	—	—	0·02	S. or long-shore wind.	Moderate	27	Long-shore wind, with much damp, and sultriness, prejudicial to health and comfort. Sea breeze, 11 a.m. till sunset, partakes of long-shore wind. Rain and lightning little known.
	10 „ 20	30·015	80·7						0·11				
	20 „ 31	29·991	80·8						0·58				
Apr.	1 „ 10	29·975	82·7	94·7	75·4	—	—	—	0·06	S. varying from S.E. to S.W.	Calm with occasional high winds.	24	Wind as last month; occasionally high; calms oppressive. Lightning about 2 days. Dew unfrequent.
	10 „ 20	29·950	83·7						0·08				
	20 „ 30	29·928	84·7						0·26				
May	1 „ 10	29·906	85·9	99·2	78·5	—	—	—	0·32	S. till middle; S. and S.W. land wind.	Occasional gales monsoon.	19†	Hot wind sets in middle of month. Sea breeze from noon till 9 or 10 p.m., occasional rain. Dew unfrequent. Lightning 4 days.
	10 „ 20	29·870	86·8						0·11				
	20 „ 31	29·843	87·7						0·65				
June	1 „ 10	29·844	88·5	98·2	79·4	—	—	—	0·34	W. or S.W. land wind till 1 p.m. E. and S.E.	High winds occasionally monsoon.	8	Hot wind, moderated by clouds and rain. Sea breeze uncertain, from 1 p.m. till 7 or 8 p.m., but frequently fails.
	10 „ 20	29·860	88·4						0·49				
	20 „ 30	29·870	87·3						0·63				

* The following remark on the preceding reply occurs in a printed Order, No. 3,697, 16th October 1860.

"With reference to the answer to the 14th question, his Excellency" (the Commander-in-Chief) "is not aware of any instance having occurred of setting aside the recommendations of medical officers in the selection of sites for new stations. The practice is, as suggested by Major General McCleverty, to leave the selection of sites to committee, and the proceedings are always placed before Government in extenso, with the opinion of the Commander-in-Chief."

† On 21st May 1811, during the gale that blew there fell 5·5 inches of rain; on the 8th, 9th, and 10th May 1820, 17·56 inches; on the 7th, 8th, and 9th May 1827, 23·30 inches; and on 16th May 1841, 3·0 inches.

Months.	Days.	Barometer Mean Height.	Thermometer, Mean Daily Temperature.	Extreme Maximum.	Extreme Minimum.	Mean Dry.	Mean Wet.	Mean Sun Temperature.	Rain.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Dew, Winds, &c.
		Inches.	°	°	°				Inches.				
July	1 to 10	29·853	86·2	85·2	78·5	—	—	—	1·00	S.W. monsoon with rain.	High winds and gales occasionally.	6	Rains of S.W. monsoon commence in heavy and partial showers. Cloudy; 8 days rainfall. Sea breeze uncertain. 3 days of lightning.
	10 „ 20	29·856	85.1						1·21				
	20 „ 31	29·865	84·8						1·52				
Aug.	1 „ 10	29·878	84·6	93·4	72·9	—	—	—	1·77	W. until middle of month, then S. or S.W.	Ditto	8	After mid-month, winds light and variable. Sea breeze uncertain from 2 p.m. till 8 or 10 p.m. Occasional dew. Lightning frequent, without thunder.
	10 „ 20	29·876	84·6						1·51				
	20 „ 31	29·887	84·6						1·48				
Sept.	1 „ 10	29·887	84·5	92·9	72·3	—	—	—	1·40	Variable	Variable	uncertain	Winds light and variable; occasional calms. Same as last month. Dew common, but light.
	10 „ 20	29·903	83·4						1·25				
	20 „ 30	29·926	83·2						1·65				
Oct.	1 „ 10	29·945	83·1	91·5	70·6	—	—	—	2·65	Variable till 19th, N.E. monsoon.	Gales	*uncertain	Clouds heavier, calms, lightning, and rains frequent till 19th, when heavy rains, with storms of wind, thunder and lightning, as in May. Light sea breeze towards mid-day.
	10 „ 20	29·972	82·0						2·43				
	20 „ 31	29·981	81·1						6·04				
Nov.	1 „ 10	29·997	79·7	87·0	67·6	—	—	—	4·49	N.E. monsoon.	Gales	uncertain	N.E. monsoon continues. Same as last month, with increased damp, and less lightning. Light sea breeze towards mid-day.
	10 „ 20	30·026	78·8						5·09				
	20 „ 30	30·053	78·2						4·55				
Dec.	1 „ 10	30·051	77·3	84·0	65·8	—	—	—	2·23	Ditto.	winds till 15th, when moderate.	13	Rains and gales moderated, and end at close of month. Sky tranquil and clear. N.E. wind throughout month. 13 days clear, 11 cloudy, 7 of clouds with rain. Dews copious, occasional fogs. Sea breeze from 10 a.m. till 4 p.m.
	10 „ 20	30·086	76·1						1·80				
	20 „ 31	30·107	75·7						0·58				
									47·53†				

* On the 30th October 1836, during a hurricane that then raged, the barometer fell to 28·285 inches.
† Average of rain annually.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. The climate of Madras, is on the whole, favourable to the health of Europeans and natives. In November, December, January, and February, the air is cool, dry, and pleasant, the thermometer being 78° in the first and 76° F. in the other months. The air is moist at the commencement of the S.W. monsoon in the beginning of May, and at the commencement of the N.E. monsoon in the beginning of October. The greatest heat is in May, when the thermometric maximum is 99° F. The greatest cold is in December and January, when the minimum is 65° F. The variability is greatest in June and July, when it is 22° F., and least in October and January, when it is 15° F., but the transition of temperature is at all times gradual from the highest heat between 2 and 5 p.m. to the lowest cold between 2 and 5 a.m., according to seasons. In December and January there is heavy dew, and occasionally a ground fog, which reaches 2 or 3 feet above the surface. The air is always damp during the "south" or "long-shore" wind in March, April, and May. Madras and its vicinity are moderately planted with trees, the greater part of which are *exogenous*, occupying the higher and driest loamy and laterite grounds; the *endogenous* being comparatively few, and growing in groups or "topes" on the lower or sandy localities impregnated with salt. The planting is sufficient to mitigate the severity of the hot season, but not so abundant as to cause any injury to health by acting as an impediment to the circulation of air at the close seasons before and soon after the rains, except at Washerman's Pettah at the N.E. of the town, where the cocoa tope is so thick and extensive that it keeps up a malarious condition of the air on that very low ground, the lowest in Madras, and at the south of the ice house, where the cocoa topes are also thick and the ground low and swampy. Irrigation by canals, wells, and tanks is not carried on to such an extent as to deteriorate the climate, on the contrary the aridity of June, July, and August appears to be moderated with advantage to health by the present extent of surface water. The air in Black town and Triplecane is loaded with mephitic effluvia at night, but during the day the air is tolerable except in the worst parts, such as Vepery, Triplecane, and Washerman's Pettah. While north winds are blowing in May and June the air in and around Madras is loaded with fine red dust, which finds its way into every crevice, adheres unpleasantly to the skin, and must often get into the lungs.

FORT ST. GEORGE. MADRAS.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	The most fatal diseases are cholera, dysentery, diarrhœa, and fevers. The second half of the year exhibits generally a considerable increase of mortality from the first three diseases. The health of native troops is usually improved by residence in Madras, except those located in the lines at Vepery, where there is much stagnant water and some offensive burial-grounds, and where remittent fevers are often severe and fatal during the rains. European troops suffer from dysentery, during and after the October rains, and from hepatitis and fever during the hot season. In the 7 years, 1832 to 1838 (see page 74, Medical Topography of Madras) the annual per-centage to strength of acute dysentery in Her Majesty's troops was 26·707, and deaths to sick treated 4·986. The annual per-centage of acute hepatitis is as 11·196, and deaths to sick 3·524. The total fevers to the aggregate strength (of that period), 4,055, was 1,744, viz., ephemeral 76, intermittent 10, remittent 2, continued 1,656, or one-sixth of the whole admissions, and their tractable nature is shown by the fact that there was only one death to every 1·74 of the patients. Europeans in Madras, as in all India, require good and abundant animal and vegetable food. They cannot bear exposure during the day till after some years of acclimation, except in the afternoon of December, January, February, and March, when they are much invigorated by athletic games in the open air. At all other times drill cannot be continued with safety after 7 a.m., nor recommended with prudence before half-past 5 p.m., and duties between these times must be conducted in the shade. Athletic exercise, however, is absolutely necessary at all seasons for the preservation of health, but must be pursued without exposure to the sun. Light khakee clothing is the best at all times, except from sunset to sunrise in December, January, and February, when cloth clothing is most suitable for men on duty. The generality of Europeans derive benefit from wearing a thin flannel jacket with short sleeves, and a broad soft flannel belt round the abdomen and loins next the skin. The flannel belt is worn conveniently by men of any length of service in India, but the flannel jacket is often prejudicial from the heat and irritation it keeps up in persons of active cutaneous circulation. Some regimental medical officers insist on their men wearing flannel jackets at all times, irrespective of feelings of individuals, but it appears to be a better and safer plan to leave European soldiers to use or dispense with this article of under-clothing according to their feelings. The abdominal belt is seldom objected to, and can be more indiscriminately used and recommended. Flannel under-clothing, with flannel stockings, is often of great service in the treatment of diseases of debility, and at all seasons, and is frequently sufficient, with attention to diet, to induce the restoration of health. January and February are the most healthy months at Madras. The prevailing diseases are catarrhs and mild continued fever. To Europeans who have resided four or five years at Madras, the south wind in March, April, and May is very depressing, and occasions neuralgic and rheumatic pains. June and July are the worst months for continued fevers and hepatitis. The most unhealthy months are August and September, when the weather is cloudy, close, and oppressive before the N. E. monsoon, and dysentery is common. It is during these months that cholera has generally raged epidemically. (See Medical Topography of Madras, p. 13.) 4. There is no district near this station which can be said to be decidedly more conducive to health than Madras itself. 5. Served at Secunderabad, Kamptee, Saugor, and Ellore. The three first-named are salubrious to those who can take proper precautions. Saugor has the advantage of a long cold season, and the nights of the hot season are cool to those who can sleep in tents. Ellore signifies in Sanscrit "the place of health," and is very healthy to those born there; but as water is within 5 or 6 feet of the surface, and the soil consists of deep rich loam, and tracts of white sand, the station is hot, and loaded with moisture. Europeans suffer from serious intermittent fevers, and natives from other parts of India resident there are very subject both to intermittent and remittent. The remittent fever which attacks natives not born there approaches very closely to yellow fever, sometimes. Ellore may also be called the head-quarters of Beri-beri, as Europeans or natives, whether born there or not, suffer more from that disease in Ellore than in any other part of the northern division. It is a bad locality to send natives to on sick leave.
III. SANITARY CONDITION OF STATION.	1, 2, 3, maps and plans of station. 4. The following are the details of the barrack accommodation;— Fort St. George was constructed about 1780, and added to from time to time. Huts at Perambore lines were erected in 1858. The huts at Royapooram are temporary. Total accommodation: European non-commissioned officers and men, 1,030.

Barrack Rooms.	Regulation Number of Men.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Beds above the Floor.	Windows and Doors. Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft. in.		Ft. in.	Ft. in.
Europeans.											
Lower Story -	1,030	1,483	18	15·6	413,851	1,000	64	1 9	177	8 0	5 0
Upper Story -		2,124¾	20	14·6	616,220	1,000	69	1 9	155	7 6	4 6
Native Troops.											
Perambore huts, 851	One man and his family in each hut	10½	8	8	672	672 per family.	84 per family.	No beds.	None.		
Barrack Guard Room, Fort St. George.	—	44	18	15·6	12,276	—	—	—	8 Door	8	5
Prison Cells, 10 -	undergoing alteration.	12	16	12	2,304	2,304	192	—	1	8	2

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	There are 81 European families living in the regimental patchery, Fort St. George. In the lower story in the S.W. corner are two bomb-proofs, included in the above estimate, as also at the south end, which are only occupied when necessary, as the ventilation is defective. They are calculated for 124 men, thus reducing the European accommodation to 906. The huts in the Vepery native lines are no two alike as regards dimensions, character, or structure. The Royapooram lines are merely temporary. The strength is not fixed in either of these native lines. The men of the native body-guard live in their own private dwellings near the stables. 5. The windows and doors in Fort St. George barracks are opposite each other generally, opening outwards. The huts of native troops have no windows. Fort St. George barracks have verandahs on all sides 11 feet broad. The native huts at Vepery and Perambore have verandahs in front 2¾ feet wide. The verandahs are not occupied as sleeping quarters by soldiers or other persons. Fort St. George barracks are provided with properly constructed Venetian shutters to the windows of the upper floor, and with pannelled ones to the lower story. The native huts have none. 6. In Fort St. George there are iron bedsteads, with canvass sacking, for European soldiers. Government supplies no bedding to native troops, who use mats or carpets, their own property. No improvements to suggest. Europeans have also issued to them a quilt, settringie, sheet, and blanket, in barracks. In tents they are furnished with the two former, and a tarpaulin or straw underneath. 7. The construction of tents is as follows:— *European tents:* 2 poles and ridge; double fly; single walls, two folds of cotton cloth. Dimensions: length of ridge pole, 6 ft. 7 in.; length within walls, 21 ft.; breadth, 15 ft.; height of poles to inner fly, 10 ft. 3 in.; height of poles between the flies, 1 ft. 6 in.; height of walls, 5 ft. These tents accommodate 20 cavalry, with saddles, or 25 infantry, on ordinary march, and 15 cavalry, with saddles, or 20 infantry, on field service. The cubic contents per man are 100 cubic feet for cavalry, and 85 cubic feet for infantry, on ordinary march, and 141 cubic feet for cavalry, or 106 for infantry, on field service. The superficial area allowed in these tents on ordinary march is 15·9 square feet per man for cavalry, or 12·6 square feet for infantry. On field service the area is 21 square feet for cavalry, or 15·9 square feet for infantry. *Native tents* have 2 poles, 1 fly, no walls, and are made of two folds of cotton cloth. Their dimensions are: top of fly from pole to pole, 10 ft.; length at bottom, 22 feet; breadth, 12 feet; height of pole, 10 feet. The same number of cavalry and infantry are allotted per tent as in the European regiments, but 50 native recruits are placed in a tent. The space per man on ordinary march is 88 cubic feet, and 13⅓ superficial feet for cavalry; and 70½ cubic feet, and 10½ square feet for infantry. On field service the space is 117 cubic feet, with 18 square feet, for cavalry, and 88 cubic feet, with 13⅓ square feet, for infantry. 8. The barracks are well ventilated by earthen pipes above in the roofs, and by half doors, the upper portions of which are generally open night and day. The huts have no ventilation, except by a single low door. Tents are well ventilated by raising the walls. During six months in the year, punkahs are used to agitate and cool the air, as a subsidiary means of ventilation in barracks. Generally speaking, the air in tents is pure. No means are provided for cooling the air in huts. No artificial means of ventilation are allowed for native corps. The huts at Perambore were recently constructed by Government on a raised basement of 5 feet, and seem well adapted for the location of native troops. Those at Vepery are exceedingly bad. They are the property of the sepoy soldier. 9. Barracks in Fort George are built of brick in mortar; the walls are plastered and whitewashed. The outer walls of the Perambore huts are of brick in mortar; in some parts of brick in clay, pointed with mortar; the inner walls of sun-burnt brick, plastered with clay; the roof of pantiles. Those at Vepery are of mud covered over with thatch or cudjan leaves. Tents are of cotton cloth, and are well adapted. 10. Some of the floors in the upper story in barracks are of teak; the rest are of square bricks laid in lime. The floor of the lower story is paved with granite slabs. The floors are well raised above the ground, from 2 to 4 feet. There is no free passage of air beneath; it is not required in this country. The floors being never damp, passages for air would be the resort of insects and vermin. The hut floors are not raised; they are formed of earth beaten down with clay by aid of water. 11. For constructing barracks, bricks and mortar are the most suitable materials at Madras. At some stations, stone can be used with advantage. In this country, the thicker the roof is the better it adds to the coolness; terraced roofs are, therefore, preferable to tiles, slates, or thatch. Asphalte does not answer in India, the heat is too great; it may, however, be used with advantage in covered wash-houses and lavatories, where the sun and hot winds do not penetrate, otherwise asphalte is always soft, and easily indented. The Perambore huts give satisfaction to the occupants. Those at Vepery are in a most dilapidated state. The walls are of mud, with roofs of cudjan leaves, supported on thin bamboos. Huts on the model of those at Perambore are recommended. The barracks are kept in repair by the garrison engineer. They are in charge of the barrack master; both under the orders of the divisional general. Repairs are promptly executed. The sanitary state of the fortress is in charge of the general. The repairs of the Perambore huts are made by the engineer department. The men receive no hutting money. The occupants repair those at Vepery. Commanding officers are responsible for the cleanliness and sewerage in the native lines. The barracks in Fort St. George are limewashed as often as required, generally twice a year or oftener, dependent on season or change of corps. On a new regiment marching in, the barracks are thoroughly cleansed and whitewashed. The same rule applies to huts. 12. The barracks have excellent and abundant baths and wash-houses, supplied with an unlimited quantity of the purest well water, brought by pipes a distance of two miles. Attached to the barracks are separate baths built of brick in mortar, plastered over with cement chunam; each bath contains about 12 cubic feet of water, and is filled with fresh water for every man separately. The water is laid on and turned off by cocks from the main water pipe. There are 82 baths and 2 lavatories open for use from morning till night. Similarly there

Fort St. George. Madras.	References to Subjects and Queries.	Replies.
	III. Sanitary Condition of Station—*cont.*	are in patchery 19 baths and 2 lavatories for women and children. None are allowed for native troops, who resort to tanks and wells near their lines. Lavatories have lately been constructed in the barracks and patchery; two ranges in each for the right and left wings; each, in the barracks, containing 50 basins; in the patchery, one containing 36 basins; another 12. They are all well drained, and the refuse water passes through the latrines, and is flushed out to sea. 13. Until lately the barrack cookrooms at Fort St. George were very bad. A new cookroom has been provided in a more convenient locality. The apparatus has been invented, or rather modified to suit local circumstances, by Dr. Duff, Madras Medical Service. One range will cook either baked or boiled meat for 150 men with ease. The food is better cooked at half the expense of fuel and attendants. Six ranges are completed, and six are in the course of construction. The cost of each range complete is about 400 rupees. The sepoys draw their water for cooking from tanks and wells near their lines. No separate cookhouses are allowed them by Government. The clothes of Europeans are washed by dhobies in tanks and watercourses three or four miles from the Fort; but the men wash their own khakee uniform in the barrack square, and dry them in the open square within the quadrangle. The sepoys generally have their linen washed in large tanks and watercourses about three or four miles distant from town. 14. The old privies in Fort St. George were as bad as they well could be. New ones are being built at a more convenient distance from the barracks, on the berm of the adjacent curtain. The new privies will be in compartments, provided with stoneware pans, which will be filled with water from self-supplying high cisterns, and the whole sewage will be flushed out to sea into five feet depth of water. At Perambore each hut has a small enclosure kept clean by toties. At Vepery there is a large open privy, but not similar to those made by the municipal department for the public. The soil from the two latter places is carried away in box carts to a distance and buried. At the body guard-lines, there are no urinals, and the privies are not sufficiently ventilated. They are provided with openings in the walls the shape of a bull's-eye. They are washed twice a day and drained into the Cooam river, distant 300 yards, by means of a covered drain. 15. The ventilation of the barracks has been before described. They are lighted with oil lamps, but 12,000 rupees has been sanctioned upon the recommendation of Professor Dr. Mayer, for lighting the rooms with gas made from oil instead of coal. The works are nearly completed, and in the course of a month it is expected they will be in useful operation. Should the project succeed it will doubtless be applied in other barracks. Native huts are not lighted by Government. 16. The sum of 50,000 rupees has been lately sanctioned for the improvement of the drainage of Fort St. George, and for the construction for public privies for troops, &c. At Perambore there are small open brick drains about one foot by six inches. A portion of these empty themselves into the Votary nullah, distant 180 yards, and others into pits, whence the earth for the basement of huts was taken. The Vepery lines appear to be perfectly uncared-for as regards drains. There are not even small surface drains round the huts. At the body-guard lines there are covered masonry drains, built underground and carried into the Cooam, on the west side of the lines, on private property. Improvements are sanctioned as above. The whole drainage will be flushed out to sea by a 12-horse power steam engine pump, with water drawn from the ditch of the Fort. When the above works are completed, the drainage throughout the Fort will be most efficient. At the body-guard and Perambore lines quite sufficient. At Vepery the rain water is carried to the Cooam, half a mile distant. No part of the barracks in Fort St. George are damp. From the materials with which all huts are constructed in this part of India, there must be great dampness during October and November when the rains are heavy. As regards the sufficiency of the drainage. In Fort George the whole will be flushed out to sea into five feet of water. At the body-guard, the fluid refuse is not left on the surface, but received into cesspits, built in connexion with the masonry covered drain. At Perambore and Vepery it is carried off by the open side street drains to the open river in the vicinity. There are no cesspits within the Fort of any consequence. There is however on the glacis distant 80 yards, a main drain, which carries all the town sewage out to sea. When the wind is in the N.E. the effluvia from it is very offensive occasionally. Government has sanctioned an expenditure of 4,000 rupees to correct this evil. The work is under execution. At Vepery and Perambore there are no cesspits. The cesspits at the body-guard lines are 2½ feet square, and situated within 100 yards of a large well, from which water is used for the horses. There is no proper means of cleansing these cesspits. There is a ditch round the fort filled with salt water, but no others. At the native lines there are none. 17. The following are the cleansing arrangements. The streets and open surface drains are cleansed every morning, in the Fort by scavengers kept solely for the purpose. The road sweepings are carried off in carts. At the native lines in a similar manner. 18. No vegetation of any kind within the Fort. Native lines free of vegetation. There are no old walls, &c. within the fort to interfere with the external ventilation. The Vepery huts are situated in the midst of a densely populated town, within the jurisdiction of the Supreme Court, and the bazaars are not under military management as in the up-country stations. The same applies also to Perambore, which however is more favourably situated, being entirely open on the north side. Brick kilns within 200 yards are springing up, a nuisance which may affect the health of the sepoy. They should be distant at least half a mile. 19. The bazaar in the Fort is well situated, but small; clean, and well ventilated; near the patchery. The bazaars at Perambore and Vepery are not under military management, but under the police and municipal department. They are not well cleaned, and in their vicinity, the atmosphere for some little distance around and about them is perfectly poisoned. The bazaar in the Fort is under the Commissioner of Police. No improvement necessary. There are no native houses near the Fort, nor dungheaps, nor cesspits. The houses at Vepery and Perambore are of all descriptions, generally belonging to a wealthy class of natives. They are free from dungheaps and cesspits. Vepery and Perambore are important towns. No nuisance in barracks from the wind blowing over native dwellings.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	20. The slaughter-houses are in the suburbs on the west side of the city, about three miles from the Fort, and half a mile from the Perambore lines. They are under the municipal board, and are provided with drain, sinkholes, and stinktraps, which are cleaned out and flushed daily by means of wells within the precincts. The offal, &c., is sold. 21. In the Fort there are stables and coachhouses allotted to regimental and various departmental officers. They are swept and cleansed daily by scavengers, and the manure is removed in carts. There are no picketing grounds. The stables of the body-guard are kept clean, and the manure removed. 22. There are no artillery or cavalry stables in the Fort. The body-guard stables are constructed of bricks in chunam, with a pent roof covering composed of Palmirah rafters, and in one course flat, with pantiles. The walls are plastered with chunam, and the floors are gravelled. The hospital is in the centre of the stables, and is considered very unhealthy. The stables are sufficiently ventilated. The manure is carried and deposited on the bank of the Cooam river, bordering the lines on the west side, and it is sold. Detachments of cavalry, artillery, and infantry are occasionally encamped on the esplanade north of the Fort, and near the sea. The horses are picketed. Such detachments are distant from the barracks and hospital, and are encamped for the purposes of embarking or disembarking. 23. In Fort St. George the patchery is distant 100 yards from the barracks. The former contains quarters for 81 families; and there are also 10 for married non-commissioned officers in the barrack square. A British regiment of its full strength has 150 families to be provided for. At present, the 43rd Light Infantry is entitled to accommodation for 126 families, and, therefore, the number beyond 91 as above occupy barrack rooms intended for the men. (This has since been corrected by the removal of a company and 15 families to Palaveram.) In native corps, quarters are provided by Government for the non-commissioned staff. These are commodious and well ventilated.
Officers' Quarters.	1. The sanitary condition of the officers' quarters in the Fort is good. European officers of native corps at Perambore and Vepery live in private houses within half a mile of the lines. Officers of the body-guard live where it suits their own convenience. When the improvements sanctioned, at a cost of 132,000 rupees, are carried out in the Fort, the barracks and officers' quarters will be most healthy and commodious, both for officers and men. At Vepery there has been great difficulty in finding suitable accommodation for officers adjoining the lines. The barrack master has been instructed by Government to rent a few houses for the purpose, which have been inspected by the engineer department, and approved of.
IV. Health of the Troops.	1. The station. The district in which it is situated and the adjoining native population are healthy. 2. The most prevalent diseases among the native population are continued fevers, diarrhœa, and dysentery. There are almost daily a few cases of Asiatic cholera amongst the natives, and occasionally it is epidemic. Spleen disease is not common at this station. 3. The healthiness of the natives is to be attributed to the salubrity of the climate and the abundant demand for labour. Those who cannot work are generally poor and unhealthy, from bad and insufficient food, and are obliged to live in the lowest and worst drained localities. 4. The following have been the previous stations of troops before coming to Fort St. George:— Her Majesty's 43rd Foot.—Was at Saugor 10 months and 14 days. Left Saugor for Madras, 13th January, and arrived there 18th March 1860. Many men on the arrival of the regiment at Saugor were greatly exhausted by the previous campaign; but the general state of the regiment was good until the commencement of the rainy season. From June to December malarious fever prevailed to a very great extent; no other form of disease prevailing. On arrival at Madras, there was little actual sickness among the men; but many of them were debilitated and cachectic from repeated attacks of malarious fever in Central India. The enervating effects of Madras during the hot season has brought on relapses of that disease, chiefly in the intermittent form in a very large proportion of cases, and the state of health of the regiment has deteriorated considerably in consequence. 4th Regiment Madras Native Infantry.—Before coming to its present station, Madras, was located at various stations at Burmah, viz., Thyetmyo, Meeday, Prome, Tabaulah, Taymeet, Mengdoon, and Rangoon. The regiment was three years in Burmah, and left Rangoon 17th May 1860, arriving at Royapooram 29th May 1860. Their state of health was bad during their whole tour in Burmah, owing to their frequent movements from one to another of the above stations. The diseases from which the corps suffered were chiefly fevers of a low quotidian type accompanied almost invariably by head symptoms, dysentery, and beri-beri. The diseases since the arrival of the corps at Madras have been fever, chronic diseases of the stomach and bowels, and boils. 34th Regiment Madras Native Infantry.—Stationed at Trichinopoly for 3 years and 24 days. Left for Madras, 12th May 1860, arrived 5th June 1860. The health of the corps at Trichinopoly was generally very good; the diseases were principally fevers, rheumatism, diseases of the lungs, and cholera. These are here stated in order of frequency. The corps was healthy on its march to Madras, and very healthy when it arrived. The diseases with which it has been affected since it came to Vepery, at Madras, have been chiefly fevers, rheumatism, and dysentery. No casualties had occurred up to 29th June 1860. Since then some fatal cases of cholera have appeared in the lines. 44th Regiment Madras Native Infantry.—Before its arrival at Madras was located at Thyetmyo. The regiment arrived at Thyetmyo 1st June 1857, and left that station 7th January 1860, arriving at Perambore, Madras, 23rd February 1860. Their state of health was very bad in Burmah in 1857–58, better in 1858–59, and good in 1859–60. In the first year 41 died in hospital, 120 were sent on sick leave. In the second year 11 died in hospital and 68 were sent on sick leave. In the third year 6 died in hospital and 46 went on sick leave. The improvement in health in each year may be ascribed to acclimation and improvements in diet. The diseases from which the men suffered chiefly were fever, beri-beri, diarrhœa, and dysentery. The medical history of the regiment in

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	Burmah leads to the inference that the climate would be less hurtful to Madras native troops if they were permanently stationed there. The health of the regiment was pretty good when it arrived at Perambore, Madras; the number of sick in hospital being 60 to a strength of 741. The great majority of the diseases were chronic, beriberi, rheumatism, and diarrhœa. The diseases from which they have suffered since their arrival at Perambore have been chiefly of a chronic nature, contracted in Burmah. As regards the comparative healthiness of different parts of the barrack accommodation at Madras, the accommodation for European troops, now that the Fort and barracks have been better ventilated, may be considered nearly unexceptionable. The lines of native troops are also good and well situated, except those at Vepery, which locality, as already described, is low, damp, mephitic, and unwholesome. 5. The troops here are never camped out for the sake of health. One or two companies of Europeans have occasionally to be encamped on the glacis of the Fort, on account of temporary want of accommodation. Some portion will be encamped after the monsoon at Palaveram, for the purposes of rifle practice. 6. Never been in charge of troops at hill stations. 7. I have not observed, nor see any reason to infer, that troops who have resided for some time on hill stations should be liable to attacks of febrile diseases on returning to the plains. On the contrary, the constitution, braced up by a residence on a hill station, would be more likely to resist febrile exciting causes. 8. Unquestionably approve of selecting hill stations for troops. 9. On going to hill stations, troops are at first liable to attacks of fever and diarrhœa. 10. To guard men from such attacks, diet ought to be nearly as usual, but care ought to be taken not to give way too much to vegetable diet. Clothing ought to be warm. Head well covered. Duties to be carried on, as much as possible after first arrival, in the morning and evening. Great care to be taken to prevent too much exposure to the sun, as this is not to be braved even on hill stations. 11. The best season for hill stations is the season which corresponds to the hot season in the plains; and, as far as opportunities of judging are afforded, troops should pass one year on the hills at least. 12. A lengthened residence is desirable, and the longer troops remain at hill stations the better. 13. Troops in leaving hill stations for the plains should be protected by adapting change of clothing to change of temperature. 14. As regards the question of locating the troops on hills, with short periods of service on the plains, or *vice versâ*. Of opinion that it would be most desirable to locate them on hill stations in preference to the best location to be found on the plains. Am of opinion that frequent changes of station on the plains are injurious, but an occasional change, as at present, is beneficial. 15. No information. 16. No experience. 17. There is no higher ground near this station which could be advantageously occupied as a station. 18. The most healthy soils and subsoils for stations are dry laterite and gravelly soils. 19. The best age for soldiers proceeding to India is from 20 to 25 years of age. The best months for landing here are January and February. European troops on first landing are sent to Poonamallee and St. Thomas' Mount. Their barrack accommodation is the same, and they are clothed in the same manner as troops long resident in the country. For some months they have little duty to perform, except attending roll-calls and learning extension drill morning and evening. The best precautions on landing are to march them from ship to barracks without exposure to the sun; to restrict them afterwards to barracks during the heat of the day; clothe them lightly; diet them moderately, and keep them from ardent spirits. 20. With proper precautions, troops should be sent direct from home depôts to India. It is advisable to send them to hill stations on landing, and afterwards to introduce them gradually to the climate of the plains. 21. Troops proceed from the port to the interior by land. The healthy march, while the debilitated are either kept at the general hospital or conveyed with the corps in carts or doolies. The regulations at present are sufficient to secure the health of newly-landed troops, if carefully attended to. Since the beginning of 1858, troops have been occasionally conveyed to the interior in coaches provided with relays of bullocks and horses. The health of the troops has been invariably good during this mode of transit, and, although necessitating what would appear to be a considerable outlay, its effects, in reality, are a great saving of money, by preventing disease and loss of life, which is often considerable in the ordinary mode of marching. 22. A British soldier in India should have 10 to 15 years' service. 23. The medical boards, as at present constituted in this Presidency, are well adapted to their duties. Conflicting opinions are seldom entertained, but each member has full opportunity and is perfectly at liberty to express his opinion. 24. Invalids should leave India in February for home.
Diseases.	1. There are health inspections both for Europeans and natives generally weekly, but at the discretion of the medical officer. 2. There is no scorbutic disease. 3. Among Europeans in 1857-58 the proportion of hepatic disease to all other diseases was 1·42 per cent., whilst in 1858-59 the proportion was 5·25 per cent.; but the question can be answered accurately only by the Principal Inspector-General, Medical Department. Heat and free living are the principal causes of hepatic diseases. They are occasionally consequent on fever and dysentery. Shelter from the sun and moderation in eating and drinking are the best prophylactics. Hepatic disease is rare among natives.

References to Subjects and Queries.	Replies.
IV. Health of the Troops. —*cont.*	4. In the body-guard, composed of natives, the per-centage of cases of guinea worm for ten years, from January 1848 to 31st December 1857, was 33. The per-centage of guinea worm to all other diseases was 30·41. Washing in tank water is the cause. Throwing quick lime occasionally into the tanks would be the best prophylactic. Dracunculus is rare among Europeans. 5. The proportion of constantly sick from venereal disease to total sick from all other diseases, is about 35 per cent. But the question can be more accurately answered by the Principal Inspector-General, Medical Department. Unquestionably no preventive measure would be better than Lock hospitals. 6. The troops at this station suffer from endemic disease. *Fevers* of the ephemeral form and intermittent types are common amongst natives. The types among Europeans are ephemeral, continued, and intermittent. *Dysentery*, both acute and chronic, chiefly amongst Europeans; but not nearly so common now, and much milder than formerly. *Cholera* is endemic amongst natives, and occasionally occurs epidemically amongst all classes. *Small-pox* is very seldom met with amongst the troops, in consequence of their being protected. *Rheumatism* is sometimes very severe, both amongst Europeans and natives. The following table gives the proportion of admissions and deaths from these diseases.

Europeans, including Officers of Regiments.

Diseases.	1857–58. Total admissions, 1,196. Deaths, 19. No officer died.				1858–59. Total admissions, 1,884. Deaths, 36. One officer died of mania.			
	Admitted.	Died.	Per-centage of Admissions to Total Admissions.	Per-centage of Deaths to Total Deaths.	Admitted.	Died.	Per-centage of Admissions to Total Admissions.	Per-centage of Deaths to Total Deaths.
Febris Ephemera	73	1	6·104	5·263	30	0	1·592	0·000
„ Quotid. intermittens	22	2	1·839	10·526	6	0	0·318	0·000
„ Tertiana	1	0	0·084	0·000	0	0	0·000	0·000
„ Continua commun.	206	0	17·224	0·000	545	3	28·927	8·333
Dysenteria acuta	9	3	0·752	15·789	106	6	5·626	16·666
„ chronica	4	0	0·334	0·000	4	2	0·212	5·555
Cholera	9	6	0·753	31·579	9	8	0·472	22·222
Variola	0	0	0·000	0·000	4	1	0·212	2·777
Rheumatic affections, viz., Lumbago, Rheumatism acute and chronic	45	1	3·762	5·262	38	0	2·016	0·000
	The other 6 deaths were from Bronchitis ch. 1; Phthisis, 1; Hepatitis acuta. 1; Anasarca, 1; Paralysis, 1; Hœmorrhois, 1.				The other 16 deaths were from Bronch. ac., 1; Hepatitis ac. 4; Hepatitis ch.. 1; Diarrhœa, 1; Delirium tremens, 1; Paralysis, 1; Mania, 1 (officer); Scrofula, 1; Asphyxia, 1; Coup de soleil, 1; Debilitas, 1; Morbus cordis, 2.			

Natives, inclusive of the European Officers.

	1857–58. Total admissions, 2,017. Deaths, 55, including European Officers, among whom 20 admissions, and no deaths occurred.				1858–59. Total admissions, 2,754. Deaths, 54, including European Officers, among whom 30 admissions, and no deaths.			
	Admitted.	Died.	Per-centage of Admissions to Total Admissions.	Per-centage of Deaths to Total Deaths.	Admitted.	Died.	Per-centage of Admissions to Total Admissions.	Per-centage of Deaths to Total Deaths.
Febris Ephemera	103	0	5·112	0·000	281	2	10·203	3·704
„ Quotid. intermittens	261	3	12·940	5·454	379	3	13·761	5·555
„ Tertiana intermittens	6	0	0·297	0·000	2	0	0·073	0·000
„ Remittens	7	1	0·347	1·818	3	0	0·109	0·000
„ Continua com.	6	1	0·297	1·818	17	2	0·617	3·704
Dysenteria, acut.	97	3	4·809	5·454	20	0	0·726	0·000
„ chronic	4	1	0·198	1·818	2	0	0·326	0·000
Cholera	12	5	0·594	9·090	11	7	0·399	12·963
Variola	9	2	0·446	3·636	6	0	0·218	0·000
Rheumatic affections, viz., Lumbago, Rheumatism acute and chronic	146	1	7·238	1·818	237	1	8·609	1·852
	The remaining 38 deaths were from Asthma, 1; Catarrhus acut. 1; Pneumonia, 1; Diarrhœa, 12; Dyspepsia, 1; Enteritis, 1; Hæmatemesis, 1; Beri-beri, 11; Fistula in perinæo, 1; Atrophia, 5; Hydrarthrus, 1; Carditis, 1; Debilitas, 1.				The remaining 39 deaths were from Rubeola, 1; Phthisis, 2; Pleuritis, 2; Pneumonia, 2; Diarrhœa, 6; Dyspepsia, 3; Paralysis, 3; Anasarca, 1; Beri-beri, 5; Abscess, 1; Ulcers, 2; Concussio-cerebri, 1; Scabies, 1; Atrophia, 4; Tetanus, 1; Debilitas, 3; Vulnus, 1.			

	7. The nosological characters of the zymotic diseases here do not differ materially from those of the same diseases in other parts of the Presidency. As regards seasons:—*Fevers* are most prevalent in the hot season; *Cholera* towards the end of the hot and beginning of the wet season, in June and July, continuing during

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	August, September, and October, and in some years till January. *Small-pox* appears at the end of the hot and beginning of the rainy season. *Diarrhœa* is met with at all seasons; but is most common when dysentery is prevalent in October, November, and December. *Hooping-cough* is most prevalent in December, January, and February. The climatic and atmospheric conditions accompanying these diseases are those mentioned above. The sanitary condition of the localities where these diseases are most prevalent, is very bad. Large meals of fermentative and indigestible vegetables after long fasts appear to be the chief personal predisposing causes. 8. There is nothing in the nature of the soldier's duties and occupations in barracks which has any influence on the spread of endemic disease; but epidemics are of frequent occurrence on the march and in the field. On the march, the diseases generally arise among the camp followers, and their spread amongst the men is favoured by overcrowding of tents, and by the healthy using the same necessaries as the sick, or being exposed to the poison emanating from the excretions of the diseased. 9. Malarial diseases not being very prevalent at this station, there has been no necessity for using prophylactic doses of quinine. 10. As regards recommendations for the mitigation of epidemic diseases at this station;—there are certain difficulties in the way of draining such a town as Madras, in consequence of its level being very little above that of the sea; but should the attempts which are now being made to overcome the engineering difficulties prove successful, the sanitary condition of the town will be much improved, and epidemic invasions in all probability greatly mitigated.
V. INTEMPERANCE.	1. The troops at the station are usually temperate. There are few confirmed drunkards, the proportion cannot be stated, and the real amount of drunkenness in a corps can seldom be ascertained. 2. There are no data from which the proportions of admissions to hospital directly and indirectly from intemperance, could be ascertained. Drunkenness *per se* is invariably punished as an offence in the 43rd Regiment stationed in the Fort. 3. Distilled spirits are sold at the canteens. The quality is of the best, supplied by the commissariat. Each man is allowed two drams a day, if he drinks no porter, but if he takes his quart of the latter he is allowed but one dram. Many men do not drink spirits, and some only a portion of that allowed. Spirit forms no part of the soldier's ration. It is optional with a man to take it at the station, on the march, or in the field, or not, as he wishes. In the 43rd it is not the habit of the men to take a dram before morning parade. The canteen is not opened till 12 o'clock noon, at which time porter is given out for the men's dinner. No man is permitted to have spirits till after his dinner. Spirits are not given to convalescents, either in hospital or in quarters. The surgeon of the 43rd Regiment has recommended that convalescents should be allowed to get malt liquor but not spirits. Spirits and porter are alone sold in the canteen. There is a regimental coffee shop, where tea, coffee, and ginger beer are sold, but nothing injurious to health. 4. The surgeon of the 43rd Regiment is of opinion that the consumption of spirits as a general rule is injurious, and that it would be far better for the health of the troops, if the sale of spirits in the canteen could be altogether abolished; wine and malt liquors being substituted for them, but the easy means of obtaining elsewhere injurious spirits presents a strong objection. If soldiers would not drink spirits, the surgeon of the 43rd is of opinion that it would lead to improved efficiency and discipline. A great improvement has taken place of late years, but the British soldier, if he could not obtain good spirits such as those sold in the canteen, would, notwithstanding restrictions, obtain spirits in the towns or elsewhere far more injurious to his constitution and general efficiency. 5. It would be prejudicial to suppress the sale of spirits in canteens. 6. Some men enjoy better health when using malt liquor, some when using spirits. Malt liquor is generally more beneficial. 7. Tea, coffee, lemonade, &c., are used at the station, and their influence is favourable to health, efficiency, and discipline; but there have not been opportunities of estimating accurately the influence of simple beverages, compared with spirits and malt liquors, where the latter are used in moderation. 8, 9, 10. Opinion. It would be prejudicial to the health of troops to suppress the spirit ration. Decidedly prejudicial to prohibit the sale of spirits in the canteen. Spirits, malt liquors, and simple beverages should be sold; the spirit always good,—old Colombo arrack, to the complete exclusion of rum. None should be issued before dinner time. The state of a corps may be known by the conduct of the canteen. In a well-regulated corps, as in a well-ordered family, comforts are used but not abused, and the members of the corps are not driven to seek their comforts from deceitful and deleterious sources. 11. The following is an abstract of the chief canteen regulations of the 43rd Regiment:— *Canteen.* May be issued daily to each man—1 dram spirits, and 1 quart porter or beer; or two drams spirits, without malt liquor. Canteen open from 12 to 1 daily, to issue malt liquor for men's dinners. Names of men and quantities issued to be checked. Canteen to be opened from ½ past 1 to ½ past 2, to issue 1 dram or 1 quart malt liquor to men who had none for dinner. To be open from 5 to a quarter to 8 p.m. to issue the remaining allowance; but men who who have had none before, not to have more than 1 dram spirits or 1 quart malt liquor. No liquor to be taken away from the canteen. Sick and duty men and defaulters to have neither spirits nor beer. Serjeants not to receive liquor at the canteen. Their allowance of spirits to be received by mess serjeants. *Bazaar.* No prohibition against the sale of spirits or malt liquors.
VI. DIET.	1. The rations issued to all European troops at Madras daily is as follows:—

Bread	1 lb.	Sugar	2½ ozs.
Meat	1 lb.	Tea	⅔ oz.
Rice	4 ozs.	Salt	1 oz.
Vegetables	1 lb.	Firewood	3 lbs.

The rations are inspected every morning by the captain or subaltern of the day; the quarter-master being invariably present. Should any complaint arise the commanding officer assembles a board to record their opinion, and whether the rations are rejected or not.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	2. The ration stoppage, three annas and four pice daily, or 5*d.* The soldier has three regular meals: 8 o'clock, breakfast, tea and coffee; 1 o'clock, dinner; 4 o'clock, tea or coffee and bread. At breakfast the men have meat, fish, or eggs, besides bread, at their option. The vegetables are 12 ozs. potatoes, and 4 ozs. of such vegetables as are procurable in the market. 3. Improvement might be advantageously effected in the barrack bread, which is said to be brown, and much inferior to seconds quality. The meat is insufficient in quality for the generality of the men. Mutton day is called starvation day, on account of the meat being poor and bony. Not less than 1½ lb. should be given. The 1 lb. of vegetables is found to be rather too much, ½ lb. would be sufficient. Improvement is still much required in some corps in the dishes in which the meals are served. Men on guard frequently receive their meals in a very disagreeable state, owing to want of care in serving and transporting them. No part of the ration can be disposed of, and no such thing has occurred in the 43rd Regiment. 4. The cookhouses are clean, light, well ventilated, and sufficiently supplied with water. The apparatus has been described above. The cooking is varied, boiled, baked, roasted, and stewed. Occasionally curry and rice. The cooking is sufficiently varied, and tea and coffee properly prepared. On a march, when practicable, hot coffee and biscuit are given on starting, and the same half way. This was done when possible on active service in Bengal. It would be better that the men should be compelled to take it, paying for it as a component part of the ration. The benefit is incalculable in a tropical climate. 5. There is no ground sufficiently near Madras or the vicinity of the Fort for soldiers' gardens.
VII. Dress, Accoutrements, and Duties.	1. The soldiers has three dresses: 1, thick cloth tunic and trousers. 2, red serge frock and thick cloth trousers; both these dresses served out in alternate years. 3, a suit of khakee. A wicker helmet covered with cotton drill: the English forage cap, with a thick wadded cover, and curtain hanging behind. Accoutrements as in England; pouch to contain 60 rounds. The present dress is suitable, but it is recommended that in lieu of the thick cloth trousers issued with the serge frock, that woollen ones of a lighter texture should be issued. There would therefore be three suits; one of thick cloth for colder weather and climate: one of serge for damp weather in hot seasons, or for warmer climate; one of khakee for hot weather. It is to be regretted that one uniform dye for the khakee is not obtained. A regiment presents a motley and not uniform appearance from the different shades of colour. With the dresses above recommended a soldier might serve in any part of India. Flannel is generally indispensable, and is constantly worn by the men of the 43rd. They have also woollen socks in addition to cotton. The dress of the guard varies according to the season. They have an excellent great coat for wet weather. European sentries are kept in the shade by verandahs or shed. They have sentry boxes for wet weather.
Duties.	1. The men should be drilled at home, decidedly, in preference to any intermediate station, before being sent to India. 2. The duties are, guards, picquets, and the usual drill. The amount of drill varies considerably with the seasons. In the hot weather (May to September at Madras) there is drill for an hour in the morning as soon as it is light. Instruction drill and rifle practice are carried on in the evening for an hour. This amount is not injurious to health, as the greatest care is taken to prevent exposure to the sun. In the cooler season drill is resumed twice a day. Drills should take place as early as possible in the morning and late in the evening. Marches should commence early enough to enable the men to arrive at the camp ground before the sun has influence. This will vary according to climate. European troops here, have at present five nights a week in bed. The company at rifle practice has every night in bed, being off duties. 3. Guards last 24 hours. All are mounted within the Fort, except one small guard at the hospital, half a mile from barracks. There are roll-calls early in the morning, at 8 a.m. breakfast, 1 p.m. dinner, 4 p.m. tea, at 5 p.m., 8 p.m., at tattoo, and if necessary during the night. Night guard is not prejudicial to health at Madras, and no additional precautions are necessary.
VIII. Instruction and Recreation.	1. The means of recreation and instruction are ball court, skittle ground, school with good schoolmaster, library and reading room, temperance room. There is no space for soldiers' gardens. There are no workshops nor gymnasia. A theatre is permitted in a barrack room. With a gymnasium and workshops, doubtless Europeans might find occupation. No man is allowed to quit the barracks in the Fort from 7 a.m. till 5 p.m. They are permitted to walk out morning and evening. They are thus never exposed to the heat of the sun or to rain during the day. 2. As to improvements, a gymnasium and workshops, as already proposed. 3. Savings' banks are already established. 4. There is not sufficient shade from trees, sheds, verandahs, &c. to take exercise.
IX. Military Prisons.	1. There is no military prison, but ten solitary cells have lately been built of approved construction, well ventilated, with 1,824 cubic feet to each inmate. An alteration is about to be made by throwing three solitary cells into one associated room. These are in the Fort, and appropriated to European troops. No cells could be better adapted for their purpose.
X. Field Service.	1. There are no local regulations for field medical service. 2. The practical working of the powers of medical officers as regards conduct of the line of march, bivouacking, camping, &c. is satisfactory. 3. The selection of camping grounds rests generally with the medical officer. Fresh ground is selected in preference. A standing camp is seldom established. Ventilation is universal in camp. Water is brought by bheesties and puckally bullocks from the best springs or wells in the vicinity. The present arrangements are satisfactory. 4. Ample arrangements are made for field hospitals. Sick carts and doolies for carrying the sick. Hospital supplies carried by coolies in medicine chests, but the principal supply is carried in carts. The regulations are embodied in the general medical regulations of the Presidency.

FORT ST. GEORGE. MADRAS.

References to Subjects and Queries.	REPLIES.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information.
XII. HOSPITALS.	1. Plan of hospital for European troops. Hospitals for native troops are in the neighbourhood of their lines.

2. The European hospital is upwards of half a mile from the Fort where the troops are. The body-guard stables are upwards of half a mile from the hospital.

On the opposite side of the main road which forms the northern boundary of the hospital in a very densely-populated village. The site is well open to the S. E., the prevailing quarter for the sea breeze, for nine months in the year. It is bounded on the south and west sides by the Cooam river, from which there arise very unpleasant odours during the dry season, especially as some of the chief drains of the town and minor drains from the penitentiary and other public buildings discharge themselves into the river. Notwithstanding all this, the locality is considered healthy by the medical officer.

3. The water in the grounds of the general hospital is brackish and unfit for drinking. Drinking water of excellent quality is brought in barrels from a well on the Poonamallee road, two miles from the hospital. There is a well of excellent water about ten yards in the front of the hospital, but it is private property.

4. There are only two drains for all purposes at the general hospital. The outlet of each is into the Cooam river, about 100 yards from the hospital.

5. The ground occupied by the wards is raised about one foot, and the wards are surrounded by verandahs on all sides. The floors are of six-inch square bricks, and have no free circulation of air under them.

There is no special provision for carrying off the rain water from the roof, but from its proximity to the Cooam river it is easily drained off from the surface. As above stated, the rain water is easily carried off to the Cooam river without any surface drain.

The walls are built of brick in chunam, and though the roof is not a double one, it is sufficiently thick to keep the hospital cool, as are also the walls.

There is a verandah ten feet broad on all sides which affords good shelter from the rays of the sun. It is provided with rattan blinds. The verandahs are never used for sick, except as a place of exercise. There is only one floor of wards.

The following table gives the accommodation:—
Total number of wards, 12. Number of beds, 192.

Wards.	Regulation Number of Sick per Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Square Feet per Bed.	Height of Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft. in.	Ft. in.	Ft. in.	Ft.			Ft. in.		Ft. in.	Ft. in.
General Hospital, 6 -	16	81 6	20 8	15 6	22,360	1,397 6	101 6	1 6	4 and 3 doors	6 0	4 0
Regimental hospital, 6 -	16	81 6	20 8	15 6	22,360	1,397 6	101 6	1 6	4 and 3 doors	7 9	4 5

The hospitals are under one roof. The wards are in pairs and communicate by seven arches.

The hospital is remarkably well placed for receiving the invigorating sea breeze of the coast.*

The windows are provided with both batten and Venetian shutters. One opens on the inside, the other on the outside. They are 3½ feet above the ground. It would be advisable to lower them, and thus add to the ventilation of the wards.

6. There are no roof ventilators, and the wards are entirely dependent on the numerous doors and windows (not stated whether the ventilation is sufficient.)
7. There are punkahs for cooling the air over the beds.
8. There are no means of warming.

The walls and ceilings of the wards are whitewashed as often as the medical officer may consider necessary. Generally twice a year.

9. The privies are unfortunately placed on the south side. Tubs only are used. No urinals or water-closets. The general hospital privy is daily washed out and charcoal burned in it. The night-soil is carried away in tubs. There is only one privy drain for urine into the river. No cesspits. Privy not offensive.†
10. There are two small bath rooms for general hospital, besides washstands holding 12 brass basins in the verandahs. The European regimental hospital has a bath room fitted with brass basins.
11. The means of bathing consist of large tubs for cold and warm water; the latter conveyed from the cook room. There is a shower bath and douche.
12. Hospital clothing is washed by native washermen at tanks and watercourses at the outskirts of the town.
13. The hospital storage is sufficient and dry, but considerable improvements might be made with advantage.
14. The cots in all European and native hospitals are either wooden frames and broad tape bottoms, or iron frames with iron straps or wooden bottoms. The bedding is of good quality. A few cots for Europeans should be furnished with posts and mosquito curtains.
15. The cooking arrangements are similar to those already described for the barracks. They promise to act well. The kitchens are sufficiently far from the hospital, but will occupy another position when the hospital is remodeled.
16. Diet roll, &c. annexed.

* With reference to this reply, his Excellency the Commander-in-Chief, in the Order already cited, desires to add the following sentence, "if the vile stinking river Cooam were not under the very noses of the patients."

† As regards this opinion, the Commander-in-Chief, says in the above cited Order "this can only be said of it recently, a year ago it was odiously offensive."

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	17. Sick are not attended by hospital serjeants in this presidency depôt. They superintend the general arrangements and keep order in hospital. The nurses are male coolies trained for the purpose. Orderlies are obtained when required. Attendance sufficient. 18. The sanitary condition of the general hospital is good. Cases of cholera have appeared occasionally among the patients when that disease prevailed in Madras, but it has never spread. Ulcers have once in five years shown a tendency to gangrene when whitewashing has been neglected. 19. There are no deficiencies of any moment; all minor defects will be remedied when the general and European hospitals (regimental) are remodeled, which they are about to be. 20. There is not sufficient exercising ground for convalescents, but that defect will soon be remedied. They are conveyed in doolies and bullock carts to the sea beach morning and evening, where they can walk and enjoy the sea air. 21. Sick wives and children of soldiers have a good detached ward next their regimental hospital; and midwifery cases are taken to the lying-in hospital. The existing arrangements are not satisfactory, but they will be when the contemplated improvements are carried out. 22. There are no special local hospital regulations beside the general regulations. 23. As regards the power of the medical officer over building repairs, sanitary improvements, diets, comforts, &c., the medical officer can only report to superior medical and military authorities. 24. There are no convalescent wards at present, but they will be included in the contemplated remodeling of the hospital.
XIII. Burial of the Dead.	1. The cemetery where the Europeans are buried is about a quarter of a mile from the hospital and half a mile from the barracks in the Fort. It is situated S.W. by S. of the hospital and W. of the Fort. Prevailing wind S.E. for nine months in the year. 2. The area of the cemetery is about $7\frac{1}{6}$ English acres. Sandy soil and subsoil. Decomposition appears to take place readily. There is no offensive odour, and the place is well kept. 3. The grave space is 7 feet by 3, with 2 feet between the graves. Depth of graves, 6 feet. Re-opened every third year; bodies readily decompose in that time. No compulsory time of interment. Burial takes place here 12 to 24 hours after death. Hindoos and Mohammedans always bury within 12 hours after death, and frequently immediately. Burning, when it is had recourse to, is within six hours after death. 4. The burial-ground is never offensive. The native grounds are offensive frequently, from overcrowding, as at Triplecane. 5. The dead of camp followers and bazaar people are immediately buried. 6. In camp especially, bodies are superficially buried, and succeeding troops are liable to suffer from encamping on the same ground. 7. No suggestions, except that officers should be prohibited from burying or allowing burials to take place in the immediate vicinity of permanent camp grounds.

(Signed) W. A. McCleverty, Major-General Commanding Fort St. George.
J. McKenna, M.D., Deputy Inspector-General of Hospitals.
H. W. Hitchins, Captain, District Engineer, Madras.

Madras, 25th September 1860.

SAINT THOMAS' MOUNT.

Accommodation, Queen's Troops, Artillery, 600.

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is an open level, with occasional small hills; the aspect is varied by villages and tanks scattered about. The hills do not form continuous ranges, but rise abruptly from the plain and stand isolated; they are covered with small shrubs, the soil not being good enough, or of sufficient depth, for the growth of trees. A small hill is in the middle of the cantonment, and the buildings are erected on the slope, from the foot towards the lower country round; it has a natural drainage and is dry. There is a swamp to the south-east, running parallel to the coast. There is no jungle or water in the vicinity. 2. The elevation of the station above the sea is 60 feet. It is 18 feet above the adjacent country, and 46 feet above the river Adyar. The ground to the west towards Palaveram is high and open, and would, in my opinion, be preferable to the present site of the barracks, viz., at the foot of the Mount Hill. 3. St. Thomas' Mount rises close behind the barracks, and is about 180 feet above the parade ground. 4. The nearest water is the river Adyar, which runs on the north and west sides of the cantonment, distant about half a mile from the west, and varying from 1 to half a mile on the north side. The vicinity is not liable to overflow of water. There are no ravines or pits near the station. 5. The station is open in many places, but in others the superabundance of trees prevents ventilation. St. Thomas' Mount, which rises close in the rear, also not only impedes ventilation, but increases the temperature of the barracks by day from reflected heat, and prevents the temperature from falling during night by radiation. The station is exposed both to the sea breeze and land wind, the former of which is conducive to health. 6. The country is cultivated in patches about the cantonment. There are numerous tanks all round, which are used for the purposes of irrigation. Artificial irrigation is probably in some instances productive of fever. The cultivation of rice is not prohibited within limits. Indigo is not cultivated, nor is the preparation of hemp or flax carried on near the station.

Saint Thomas' Mount. Madras.	References to Subjects and Queries.	Replies.
	I. Topography—*cont.*	7. The native town lies close on the east side of the station. 8. The geological structure of the district is gravelly. The cantonment has occupied its present site for 80 or 90 years, having been previously occupied by native population. 9. The depth below the surface at which water is found is 6 feet in the rainy season. 10. The rain-fall and water are rapidly absorbed in the soil. The drainage from St. Thomas' Mount passes into the subsoil of the station. 11. The water supply of the station is derived from wells, and is not stored in open tanks. The tanks outside the station are filled to overflowing during the rainy season; but are nearly all of them dried up during the hot season. No tank used for drinking purposes is used for bathing, They are not liable to pollution from leaves or other matter falling into them, or from foul drainage passing into them. There are no tanks in the station, but I consider it probable that some degree of malaria is produced by those in the neighbourhood. A belt of trees round each tank would probably obviate the effects of the malaria. 12. The supply of water from the wells is abundant. The water from some is brackish, and unfit for drinking purposes, while that of others, within a very short distance, is excellent. Those used for drinking purposes contain excellent water. It is raised by windlass and bucket. 14. The only portion of this query I am able to answer is, that new stations are selected by a committee.
	II. Climate.	1. The instruments available at the station for conducting and registering meteorological observations are a barometer, thermometer, and pluviometer. 2. (No meteorological observations transmitted.) 3. The climate is dry for at least nine months, and hot all the year round, varying from 71° as a minimum to 95° as a maximum. There are heavy rains during the months of October and November, when the north-east monsoon prevails, and occasional showers from July till September. The average annual fall is between 30 and 40 inches. The climate is very equable; fogs rare. There is considerable damp during the north-east monsoon, and in a lesser degree during the south-west monsoon; tree-planting is superabundant. There is considerable irrigation of rice grounds; but it does not perceptibly influence the climate. The air is very dusty during the dry season. The effect of the climate on the health of the troops is debilitating from the excessive heat. A moderate admixture of animal and vegetable food; the total abolition of spirituous liquors, and the substitution of a moderate quantity of malt; woollen clothing during the prevalence of the rain and cool season; drill in the morning alone, to be finished before the sun has acquired much power; and the evenings to be given to the soldier for his recreation and exercise, are the precautions necessary to avoid its influence. The most grave and fatal forms of disease prevail from October to the end of December. The healthiest months are January and February. Fever, dysentery, and hepatic disease are the most prevalent during the unhealthy months. 4. There is no district near the station, the climate of which is more conducive to health. 5. The following are the stations at which I have served:—Neilgherries, Sholapore, Trichinopoly, Saint Thomas' Mount, Rangoon, and Quilon. I have named them in the order of their comparative salubrity. I do not consider any of them to be positively injurious, except from the fact of their being tropical climates. The only one positively conducive to health was the Neilgherries.
	III. Sanitary Condition of the Station.	1, 2, 3. A map of the station, adjacent country, &c., has been forwarded. 5. There are windows on both sides of the barrack rooms, which open outwards. There are verandahs on both sides. They are never occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils. 6. Both iron and wooden cots are used in barracks. 7. The tents used in camp are double-poled, to contain 25 Europeans. 8. The ventilation of the barracks, &c. is effected by an opening in the roof, and is sufficient. Punkahs hung from the roof, in shape like a door, are used for cooling the air of the barrack rooms. 9, 10. The materials of which the barracks are constructed are bricks. The tents are of canvass, and the huts are built of mud. The floors are made of chunam or brick. 11. The barracks are too low, being only 12 feet high, and therefore unsuited to the climate. Every barrack in this country ought to have an upper story, or to be sufficiently elevated on arches so as not to require it. The barracks and cantonment are kept in repair by the engineer officer. The walls and ceilings are cleansed and limewashed when required; generally annually. 12. Each lavatory contains a tub filled with water by a bheesty or water-carrier, in which the men wash; this practice should be abolished and a sufficient number of basins supplied instead. 13. Cook-houses of the usual construction. The linen is washed and dried out of barracks by washermen, quite sufficient for the wants of the station. 14. The urine is collected in tubs and thrown into a drain. The solid sewage is carried away daily to a considerable distance from the hospital. 16. With regard to the draining and sewering of the barracks, the drains are only flushed by the emptying of the bath rooms and the rain. These means, however, are insufficient, and consequently the drains are frequently in a filthy condition. No part of the barracks or hospital is damp. The fluid refuse is conveyed away by drains to a very short distance from the barracks and hospital, where it is allowed to sink into the soil. There are no cesspits. There is a foul ditch close to the outer wall of the hospital, which the engineer officer is engaged in rectifying. 17, 18. The cantonment is kept very clean, and the surface is freed from vegetation. There are numerous hedges about the cantonment which certainly impede ventilation. 19. The sanitary condition of the bazaar is bad, being narrow, crowded, and badly ventilated. Each person is responsible for the cleanliness of the front and rear of his premises. The condition of the native houses near the station is good. There are no cesspits or dung heaps within them. No nuisance is experienced from the wind blowing over the native dwellings. 20. The animals for the use of the soldiers are slaughtered a long distance off from the station.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	21. There are no stables in the bazaar, nor are cattle allowed within it. 22. There are no stables in use by the artillery. The picketing ground is some distance from the barracks. Horses are picketed in lines, parallel to each other. 23. The quarters for married non-commissioned officers and men are insufficient; others are being erected.
Officers' Quarters.	1, 2. The sanitary condition of the officers' quarters is very good. No improvements are suggested.
IV. Health of the Troops.	1. The station and the district in which it is situated is healthy, as also is the native population. 2. The most prevalent disease among the natives is fever of the intermittent character. Cholera and small-pox occasionally break out in an epidemic form. Spleen disease rarely occurs. 3. These diseases are due to crowding, want of ventilation, and filth. 4. Troops are received at this station from England and all parts of the Madras presidency, it being the depôt of the sick of the Madras Artillery and Company's European regiments. The barrack-rooms known as the troop lines are greatly superior to those already described as close to Saint Thomas' Mount, being in a much more open position, and one of them very lofty. 5. Troops are camped out when the barrack accommodation is insufficient for their number. 6, 7, 8. With reference to hill stations, and their effect on health, I have no experience, for although stationed on the Neilgherries, I was not in charge of troops, but I believe it is an established fact, that long residence on those stations renders troops more liable to febrile and other diseases on returning to service on the plains. I approve of the selection of hill stations for troops. 9, 10. The diseases peculiar to hill stations are pulmonary and bowel complaints. The precautions necessary to guard against such attacks are, to avoid getting wet, by wearing warm clothing and stout boots and shoes. 11, 12. With reference to the seasons best adapted for residence on hill stations, they vary with the position of those stations in India. The shortest period of residence to obtain any benefit from them, should be not less than two years. 13. The special precautions for the preservation of health of troops on leaving hill stations for the plains are, adaptation of clothing to the climate, to avoid unnecessary exposure to the sun, and to reduce the quantity of their animal diet. 14. I am of opinion, that long periods of service on the plains should alternate with short periods of service on the hills. Frequent change of station on the plains is beneficial to the health of troops and convalescents. 15, 16. With regard to barrack and hospital accommodation on hill stations, that provided at Jackatalla, on the Neilgherries, is excellent. My experience is confined to Jackatalla. 17, 18. There is no higher ground near the station, which could be advantageously occupied as a hill station. No particular classes of surface and subsoil are more healthy for stations than others. 19. Soldiers should not proceed to India under 21 years of age, but 25 would probably be the best age. The best period for landing is January. Upon first landing, they are put into barracks, dieted, &c. To preserve their health, they should be clothed lightly in hot weather; all unnecessary exposure to the sun avoided; the stiff stock should be entirely dispensed with, and they should be prevented from having access to spirituous liquors and the unripe fruits of the country. 20. A previous period of service at the Cape or New South Wales would prepare troops for service in India. On landing in India they should, in the first instance, be sent to the coolest station on the plain, from thence brought to the hottest stations, and after a certain period of service there, sent to the hills. 21. Troops are usually marched from the port to the interior. Every precaution is taken to preserve their health. 22. As a general rule, from 15 to 20 years is the period a British soldier should serve in India. 23. The manner of conducting medical boards could not be improved. 24. Invalids should leave India so as to reach England at the commencement of summer.
Diseases.	1, 2. There are no regular inspection parades for the discovery of incipient diseases. There has been no scorbutus at the station. 3. The proportion of cases usually under treatment for hepatic disease is from four to five. It is caused by long-continued solar heat and intemperance; it is frequently the result of fevers, and the prophylactic measures are, the avoidance of stimulants and of exposure to the sun, and the careful protection of the body while on night duty. 4. Dracunculus has very seldom come under my observation. 5. The proportion of venereal disease to the total sick in hospital is 7 in 54. The precautions for diminishing the disease would be the removal of all diseased women from the cantonment, or treating them in a lock hospital. 6. The troops at the station suffer from the fevers and bowel complaints of the country, but not in an unusual proportion. 7, 8. In fevers, head symptoms prevail, and in dysentery the mucous membrane of the large intestine suffers. Fevers and dysentery are most prevalent during the monsoon, and hepatic complaints during the hot season. I have remarked no particular climatic or atmospheric change beyond those ordinarily accompanying the seasons at which those diseases occur. The sanitary condition of the bazaar is bad, as before stated. The personal habits of the troops predisposing to these diseases are, drinking spirituous liquors, exposing themselves carelessly to the night air, and eating unripe fruits. 9. Quinine has not been tried at this station as a prophylactic against malarial diseases. 10. Well ventilated and capacious barracks and hospitals, proper drainage, proper latrines, and abundance of water for the purposes of ablution, avoidance of exposure to the sun, protection from night air when on guard, wholesome and nutritious diet, abstinence from spirituous liquors and the substitution of malt liquor for the same, would prevent or mitigate epidemic disease at the station.

Saint Thomas' Mount. Madras.	References to Subjects and Queries.	Replies.
	V. Intemperance.	1, 2. There are no returns to show the temperate or intemperate habits of the soldiers kept in the station; they are kept by the regiments, and there is no regiment here now to afford the information. The Europeans stationed here are all recruits lately joined. Drunkenness is always punished as an offence. 3. Distilled spirits are not sold in the canteen, but in the bazaar, under civil authority. Spirits are not allowed to be sold to Europeans. Soldiers are permitted to draw two drams of arrack at the station, and the same on march or in the field. No liquor is issued till dinner time (one o'clock). It depends upon the surgeon whether spirit is given as ration to convalescents. No deleterious drinks other than intoxicating drinks are sold at the bazaar. 4. The consumption of spirits, if taken in moderation, is conducive to health and discipline. 5 to 9. It would be beneficial to abolish the use of spirits as part of the ration, if malt liquor could always be issued. Wine and malt liquor are preferable to spirits in their influence on health. Tea, coffee, lemonade, and similar drinks, are much used at the station. There is no difference in their influence on health, as compared with spirits and malt liquor, if the latter are taken in moderation. 10. The canteen funds are insufficient to provide amusements to keep the men from drinking. 11. The canteen and bazaar regulations are prescribed by general orders. No station orders exist.
	VI. Diet.	1. The rations for Queen's troops and European troops in the Indian army are the same, and consist of— 1 lb. of meat (beef or mutton). | 1 lb. of vegetables. 1 lb. of bread. | Tea or coffee. A responsible inspection is made of the constituents of the ration. 2. The stoppage is 6 rs. 5 annas 4 pie per month. The soldiers have two meals a day:—Breakfast at 8 a.m., dinner at 1 p.m. 3. No improvement is suggested in the ration. Arrangements are made for preventing it being disposed of by the troops. It is issued to the soldier cooked, at meal times, at meal parades. 4. The cooking is performed in pots and pans, which are the only means and apparatus available. There are no kitchens, only cooking houses. The food is both boiled and roasted, and is properly done and sufficiently varied. The men have coffee half-way on the march. 5. Gardens for the cultivation of vegetables by the soldier could be advantageously established near the station, under such regulations as may please the men; there should be no compulsion.
	VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of cap, coat, trousers, boots, pouch, and sword belt. It is very well adapted in all respects for the climate. No improvement is suggested.
	Duties.	1. It would be advantageous if the men were drilled at home before being sent to India. 2. The usual routine of soldiers' duties is one hour drill morning and evening, but generally only in the morning three times a week. The best time for drill, parade, and marching is in the early morning. The hours are prescribed by general orders. The men have three nights and upwards in bed during the week. 3. The distance at which guards are mounted depends on circumstances. Guards last 24 hours. Rolls are called during the day, but not at night. Health is not affected by night guards.
	VIII. Instruction and Recreation.	1, 2. The following are the means of recreation and instruction:—There are ball courts, skittle-grounds, schools with good schoolmasters, and a library and reading rooms, lighted at night. There are no day rooms or soldiers' clubs, neither are there any soldiers' gardens, workshops, theatre, or gymnasia. The means are sufficient to keep the men occupied during the wet season and heat of the day. There is no restriction on the men as to exposure to the sun and rain when off duty; few men like going out at those times. No improvement is suggested in the existing means of recreation. 3. There is a government savings' bank. 4. There is not sufficient shade from trees, &c. to enable the men to take exercise without injury during the day.
	IX. Military Prisons.	1. There is no military prison, but cells and rooms are attached to battalions.
	X. Field Service.	1. There are no local regulations for medical field service not included in the general presidency regulations. 2, 3. As regards the conduct of the line of march of troops, bivouacking, camping, &c., the medical officer is consulted on these points by the commanding officer. Encamping grounds are fixed sites, so as not to interfere with cultivation. The encamping space is sufficient only for one regiment. 4. Arrangements are made for the transport of the sick according to the strength of men in the corps.
	XI. Statistics of Sickness and Mortality.	I have no documents to enable me to answer questions under this head.
	XII. Hospitals.	1, 2. The hospital is well situated, and faces the N.E. It is at right angles with the barracks, only the main road intervening. The bazaar is about 500 yards from it in a northerly direction, and the houses of the civil population are distant about 800 yards. The site is open, but imperfectly ventilated, owing to its being surrounded by a wall and outhouses; the former could be lowered with advantage to two feet, and surrounded by a railing. The hospital labours under the same defect as the barracks, being too close to the mount. The situation, with the above exceptions, is healthy. 2. The water supply is abundant and wholesome. 4. The drainage of refuse water and other impurities is effected by open drains leading into another drain outside the hospital precincts.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	5. The lowest wards are raised about 5 feet from the ground. The wall surrounding the hospital prevents the free perflation of air through the lower wards. The roof water is conveyed away by drains. There is a large open chunam drain outside the hospital, which receives the rain water from it, and carries it rapidly away. The hospital is built of bricks and chunam; the roofs and walls are single, but sufficiently thick to keep the hospital cool. It is surrounded on three sides by a jalousied verandah, 10 feet wide, and enclosed behind. The verandahs afford sufficient shelter from the sun's rays. They are sometimes used for the accommodation of sick when the hospital is crowded. The hospital consists of two flats.

Table of Accommodation.

Wards.	Regulation Number of Beds per Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
4	18 each	Lower ward 60′	Lower ward 16′ 10″	Lower ward 21′	Lower ward 21,210	Lower ward 1,178	19ft. 72in.	1ft. 4in.	Lower wards 6 on each side.	Lower wards 6 ft.	Lower wards 3′ 8″
		Upper ward 61′ 3″	Upper ward 18′	Upper ward 16′ 3″	Upper ward 17915·7·6	Upper ward 995			Upper wards 9 on each side.	Upper wards 5′ 7″	Upper wards 5′ 8″
Two side rooms.	Each can contain 4.	28 ft. each.	12′ 6″ each.	12 ft. each.	4,200	1,050					

The hospital is situated so as to receive the full benefit of the prevailing winds. The windows open outwards, and their arrangement and construction is conducive to ventilation and coolness.

6. The ventilation of the wards is effected by means of windows and ventilators in the wall. The means are sufficient to keep the wards airy.
7, 8. The air admitted to the wards is cooled by means of punkahs and grass tatties during the prevalence of the land wind. There are no means of warming the wards.
The walls and ceilings are cleansed and limewashed about once a year.
9. The privies belonging to the hospital are small outhouses, with a covered way. There are bed stools for bad cases. The privies are placed over cesspits.
10. The hospital has an outhouse for lavatory purposes, which contains a bath.
11. The sick are bathed in a bathing house; the arrangements for this purpose are quite sufficient.
12. The hospital clothing is washed and dried by a washerman outside of the hospital.
13. The storage is sufficient and dry.
14. The bedsteads and cots in use in the hospital are constructed of iron and wood.
15. There is a cooking house detached from the hospital, and the diet is cooked in pots and pans; there is no apparatus.
17. The attendance provided for the sick is as follows:—1 hospital serjeant, 1 conicopoly, or purveyor, 1 tailor, 1 cook, 1 cook's mate, 4 ward coolies, 3 first-class coolies, 4 sweepers, 4 toties, and 2 female nurses (one European and 1 native). The attendance is sufficient.
18. The sanitary condition of the hospital is good, and no epidemic disease has appeared in it.
19. The only defect is the imperfect ventilation of the lower wards of the hospital from the surrounding wall.
20. The provision made for the exercise of convalescents is by sick carts and doolies; seats are set apart for their use in the verandahs and on the top of the hospital.
21. Soldiers' sick wives are treated in hospital. The present arrangement is satisfactory.
23. The powers of the medical officer in respect to the repairs of the hospital are confined to a representation of any defects that come to his notice. In matters relating to the sanitary state of the building, change of diet, and medical comforts, at stations, camps, and on the march, he possesses full powers.
24. There are no convalescent wards, and I do not think such accommodation would be an advantage.

XIII. Burial of the Dead.

1. The burial-ground is in the station about three-quarters of a mile from the nearest barrack. It is situated on the north side, the prevailing winds being on the opposite side of the compass.
2. Its area is about 150 yards by 100. Decomposition does not take place readily. The soil is all gravel. The ground is carefully kept.
3. The grave space allowed is 7 feet by 2½ feet, and the interval between the graves is 2 feet. They are 5 feet deep. The graves are never re-opened. Only one body is interred in each grave. Interment is compulsory, at all times, at or before sun-rise or at sun-set. There are no rules with reference to burial-grounds used by native troops.
4. The grave-yard is never offensive.
5. The dead of the bazaar people and camp followers are disposed of outside the cantonment.
6. No injury to the public health accrues from the present practice. No improvements can be suggested in the burial or disposal of the dead.

(Signed) E. Amsinck, Brigadier,
Commanding Mount.
Arth. S. Moberly, Captain,
District Engineer of Chingleput.

15th April 1860.

BANGALORE.
MADRAS.

BANGALORE.

Accommodation
- Queen's Troops
  - Artillery - 215.
  - Cavalry - 729.
  - Infantry - 745.
- Native Troops .
  - Artillery - 235.
  - Cavalry - 339.
  - Infantry - 2,090.

References to Subjects and Queries.	REPLIES.
	(*The following answers are by the Deputy Assistant Quartermaster-General of the Mysore Division.*)
I. TOPOGRAPHY.	1. The general aspect of the country surrounding the station is open, with topes of trees, and tanks scattered about. It is undulating, the high ground being dry and sandy, and the low ground swampy in the rains. There is no wood or jungle in the vicinity, but numerous tanks of all sizes.
	2. The elevation of the station above the sea is 3,000 feet; and in parts it is higher, and in parts lower than the adjacent country. One part of the station is nearly on a level with the Ulsoor tank, while other parts are 200 feet above it. There is higher ground near the station, but none with any advantages over Bangalore in a military point of view.
	3. Nundydroog, 36 miles distant from the station, is 1,600 feet above its level, and is one of several small hills. The Commissioner has a house on Nundy, where there is water, which is also to be found on one other hill also.
	4. Small tanks surround the station at all distances. There are no rivers, but numbers of small nullahs, which are dry in the hot season; there is no marsh. The vicinity is not liable to overflow. There are several ravines round the station caused by the rush of surface water in the rains; but they have no bad effect on the health of the station.
	5. The station is pretty open, freely exposed to winds, and not much encumbered by trees, hedges, gardens, or higher ground. All trees and hedges are kept topped to a certain height, so as not to interfere with the ventilation. All buildings of large extent must raise the temperature of the air about them. In Bangalore this applies to barrack squares. Variable, but scarcely to be called cold, winds blow through the station. There is no sea breeze, and the land wind is not hot like that up the country. The winds are very dry, and conducive to fever diseases.
	6. The country surrounding the station is cultivated; but there are no works of irrigation further than those in general use in India for irrigating small fields and gardens. No rice cultivation is allowed in military stations; but this being a civil station, it cannot be prevented by military authorities. None worth mentioning, however, is cultivated. Neither the cultivation of indigo, nor the preparation of hemp or flax is carried on near the station.
	7. The fort and native town are distant about one mile from the station.
	8. No reply to this query.
	9. Water is found at different depths, according to the level of the surface of the ground. It is generally to be obtained at some 15 feet lower in the dry than in the wet season.
	10. What water does not come in the tanks soaks in the surface, and remains at a certain level, according to the season and the height of the water in the nearest tank. There seem to be no springs, and all wells are supplied by this surface water till used up. There is some adjacent higher ground, the drainage of which flows into two tanks in the station.
	11. The supply of water for the station is derived from wells and tanks, but is not stored at all. In monsoon time all the tanks in the country are full after a sufficient quantity of rain has fallen; but in the dry seasons they get gradually smaller. Water lilies, weeds of all descriptions, fish and frogs in great quantities, abound in the tanks and wells. All the open tanks in and about the station are used by the natives both for drinking and bathing purposes. The water for Europeans is taken from wells. These latter are open, and when they get dirty are cleaned. The Ulsoor tank, which supplies drinking water to the greater portion of the native population of the place, is the outlet for the whole drainage of a most filthy bazaar of both the cavalry, infantry, horse artillery barracks, and of the greater portion of the station. It is in a most filthy state. This tank in the dry season is a great nuisance. (*Remark by the Commander-in-Chief.*) "The disgustingly filthy nature of the source from which the water used at Bangalore is taken has been brought to notice scores of times by me within the last 4½ years, but, as usual, nothing has been done to remedy this most crying evil." (Signed) P. G.
	12. All drinking water is raised from wells, some in the compounds, some is carried on bullocks, and some in water carts. Colonel Cotton is now organizing a scheme by which water could be brought in at a high level to the station from Nundydroog, 36 miles off. Should his scheme be practicable, and succeed, it will be a great boon, as though the station is never actually at a loss for water, still in the dry seasons the supply is by no means abundant.
	13. I am not aware of any other topographical points bearing on the health of the station not included in these queries.
	14. New stations are generally selected after the fullest inquiry by Government through its officials, both civil, military, and medical. When a position is selected, the Quartermaster-General's department carries out the details. I can suggest no improvement in the manner of conducting this service.
	(*The following answers are by the Deputy Inspector-General of Hospitals, Mysore Division.*)
II. CLIMATE.	1. Meteorological observations have been made at many of the hospitals in the station for many years past, but the instruments have in most cases been of inferior construction, and the observations not having been made upon a definitely arranged plan, it is not possible to construct from them any table of observations for a long series of years.
	2. The following very accurate table of observations can be given for the year 1859, to which certain notes are appended, which embody the most important points of the observations of previous years. (Data can be had for forming a table of observations for five years from 1830 to 1835, at page 62 of the Medical Topography of Malabar, Canara, and Mysore, compiled by the Madras Medical Board.)

TABLE of Meteorological Observations from 1st January 1859 to 1st January 1860.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds.		Days of Sunshine.	Remarks as to Clouds, Dew, Wind, Storms, &c.
										Direction.	Force.		
						Difference between.							
January -	27·33	69·09	20·32	79·25	58·93	9·77	—	—	—	N.E.	Moderate	—	Sky clear.
February -	27·28	73·26	20·11	83·32	63·21	12·39	—	—	—	N.E.	Moderate	—	Ditto.
March -	27·26	78·83	18·23	87·95	69·72	11·74	—	—	—	N.E.	Moderate	—	Ditto.
April -	27·22	78·45	14·28	85·59	71·31	9·70	—	—	1·34	N.E.	Calm -	10	Occasionally cloudy.
May -	27·12	81·67	18·47	90·91	72·44	9·00	—	—	3·75	Variable	Calm, squall	9	Ditto.
June -	27·06	76·59	15·64	84·41	68·77	5·86	—	—	1·60	W.S.W.	Moderate	16	Generally cloudy.
July -	27·03	77·06	14·68	84·40	69·72	2·64	—	—	5·62	W.S.W.	High -	21	Ditto. Thunder.
August -	27·07	74·74	12·19	80·84	68·65	4·90	—	—	5·39	W.S.W.	Moderate	20	Ditto.
September	27·08	75·72	12·46	81·95	69·49	5·63	—	—	3·21	Variable	Calm -	14	Ditto. Thunder.
October -	27·13	75·44	12·97	81·93	68·96	6·77	—	—	1·10	N.N.E.	Moderate	10	Cloudy first half. Clear second half.
November	27·12	72·86	11·29	78·51	67·22	3·16	—	—	2·87	N.N.E.	Moderate	15	Cloudy at times.
December	27·17	71·59	16·33	79·76	62·43	6·58	—	—	0·04	N.N.E.	Moderate	3	Clear. Foggy morning times.
	27·15	75·44	15·67	83·24	67·57	—	—	—	25·50	—	—	118	

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	This season was an unusual one, the rain being 10 inches less than the average 35·41 inches of 25 years. The rainy days, however, were more numerous, 118 to 77; but this arises probably from the use of an instrument which registered even minute falls, whilst in former years small falls were not noted. The thermometric observations were taken with a maximum and minimum instrument in the shade of an open verandah. The maximum noted was 97°, and the minimum 55°·50; the mean sun temperature was not ascertained. The average temperature during the year inside another house and by different instruments was found to be 74·53. The temperature of spring water taken from a well 63 feet deep at 9 a.m., 28th April, was 75·45. The average temperature of the years 1805–06 is given 75·13, and from Heynes' Tracts the average highest range of the thermometer when exposed was 106°·33, and the average lowest when exposed 63°·58. This was for five years (1831–35). 3. The climate of Bangalore is one of the best in India, owing to its physical situation in the middle of the open, undulating, cultivated plain, the heat of which is tempered by the light rains and clouds brought by the monsoons, and by the elevation above the sea of 3,000 feet. The sun's rays are generally powerful, but in the shade and at nights the temperature is moderate, and in November, December, January, and part of February the cold is so great as to render warm woollen clothing in the day pleasant and blankets at night necessary. The atmosphere is rarely very damp, for there are no extensive sheets of water or swamps in the neighbourhood, and the rains, though protracted in their period of falling, are rarely heavy. The natural dryness of the air in the hot months of March, April, and May is, however, lessened by the existence of numerous artificial lakes or jheels, varying from 50 yards to half a mile or more in diameter, all over the country neighbouring the station. In the wet months of June, July, and August the sky is generally so overcast with dense clouds, that exercise in the open air during the day may often be taken with impunity by Europeans if suitably clothed. Thunder storms are frequent in April, May, August, and September, and occasionally in June, July, and October. But though the climate be so generally agreeable to the feelings of a European, it is necessary that he should remember he is in the tropics, and not expose himself much to the sun, which is so hot that the alterations of temperature in the open air between day and night are very great, and must be trying to any constitution exposed to them. The climate is most favorable to the health of the troops, and, from the experience of many years, shows that the mortality among European troops stationed at Bangalore is less than in almost any other station in the south of India. Severe fevers are rare, cholera seldom commits great ravages, and though hepatic affections and dysentery are to a considerable extent suffered from, it is probable that they may principally result from indiscretions or exposure in a climate which, though pleasant, is still tropical by situation and in character. The fine cool climate permits of the cultivation of potatoes, cabbages, &c., so that the troops have at Bangalore the advantage of a plentiful supply of wholesome vegetables. Officers at Bangalore generally enjoy excellent health. European children thrive till 8 or 9 years of age, and many instances can be adduced of children born and reared in the place having attained able-bodied maturity. In consequence of the comparative coolness of the climate more exercise may be taken, and the clothing should be warmer at times than in the hotter climates of the plains of south India. The more healthy months are the dry months, viz., December, January, February, March, and April, and two in the middle of the rains, August and September. The most healthy months are February and March, and the most unhealthy are those at the commencement and end of the rains, May, June, July, and again October and November. The prevailing diseases as influenced by climate are catarrhs and fevers, hepatic affections, cholera, and dysentery. 4. There is no other district near the station the climate of which is more conducive to health, but there is a great extent of country round about, where the climate influences would be equally favourable to health; and there are a few flat-topped hills near, as Nundydroog, where small sanitaria for invalids might be established. 5. The following is a list of the stations at which I have served, viz., 1829, Trichinopoly, D.D. H.M.'s 89th regiment; a very hot and dry climate, particularly favourable to natives. 1834, Palaveram, 27th regiment native infantry, within 12 miles of Madras and Bangalore, one of the most healthy and agreeable climates in the Madras Presidency, and well suited

NGALORE.
ADRAS.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	for troops lately arrived from Europe; still there are a greater number of diseases existing there than in most of the warmer stations, owing to the greater variety in temperature. 1837, Arcot, 5th regiment light cavalry, in the Carnatic, within 70 miles of Madras, a cavalry brigade station, generally healthy, but subject to periodical attacks of cholera. 1840, Bellary, 5th regiment light cavalry, a hot and dry station. While a European regiment was stationed there, with all its followers in the fort, the place was seldom, if ever, free from cholera, but latterly very fine barracks have been built in the open plain, and since that the station has become one of the most healthy in the Presidency for European troops. 1843, Sholapore, 5th regiment light cavalry, in the Bombay Presidency, generally considered one of the worst stations; extremely hot and disagreeable from about the 10th March to the end of May, after which it becomes tolerable enough, and in December and January is very cool and agreeable. 1847, Jaulnah, 5th regiment light cavalry, a very fine climate, situated in the Hyderabad territories, principally occupied by native troops, and generally remarkably healthy. 1850, French Rocks, 1st regiment native infantry, much the same climate as Mysore or Bangalore, garrisoned by one native regiment. 1851, Bellary, 1st regiment light cavalry. 1853, Bangalore, 1st regiment light cavalry. 1856, Vizagapatam or Waltair, as garrison surgeon; a civil station situated in an elevated rising ground, and projecting somewhat into the sea, so that a sea breeze is felt on three sides, rendering the climate delightful and healthy. 1857, Madras, as superintending surgeon. 1858, Malabar and Canara, as superintending surgeon, and from that removed to the centre division, and on that division being abolished, I was ordered to Bangalore (where I am at present stationed) as deputy inspector-general of hospitals.
III. Sanitary Condition of Station.	1. (*Answered by Deputy Inspector-General of Hospitals, Mysore Division.*) A photograph of plans of the station and surrounding country is in the quartermaster-general's office. 2. There is a photograph of plan of the station itself in the police office; but there is no plan in existence that shows all the minute details wanted, nor could one be drawn, unless after a careful survey, I believe. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) Some of the drains about the barracks are covered, some are open. Most of these are built of masonry, and all have a free outlet into the principal tank of the station, not greatly to the advantage of the native population, who use largely for drinking purposes the water of the tank in question. The wells in the different compounds are innumerable, and each house has its own dung-heaps and ashpits. There are no public privies or urinals except those in the European barracks. 3, 4. Particulars of accommodation in the various barracks at Bangalore. *By Officer commanding H. Artillery.—Horse Artillery.*

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.			Remarks.
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.	
		Ft. in.	Ft. in.	Ft. in.			Ft. in. Ft. in.			Ft. in.	Ft. in.	
2 Ranges of barracks, each	90½	198 6	21 0	22 0	91,575	1,000	6 6 × 2 6	18 in. & 2 ft.	26	8 0	4 0	
4 Married serjeants' quarters at the ends of each range in 3 rooms.	1 „	13 0	18 0	17 0	3,978				38 swing.	6 0	4 0	
	1 „	13 0	18 0	17 0	3,978				1	1 6	3 0	
	1 „	8 0	18 0	17 0	2,448				2 swing.	6 0	4 0	
									1	1 6	3 0	
									1 swing.	6 0	4 0	
									1	1 6	3 0	
Single serjeants	1 „	10 0	18 0	17 0	3,060				1 swing.	6 0	4 0	
	1 „	12 0	18 0	17 0	3,672				1	1 6	3 0	
	1 „	8 0	18 0	17 0	2,448				1 swing.	6 0	4 0	
									1	1 6	3 0	
									1	1 6	3 0	
2 Serjeants' quarters between the ranges in 2 rooms each.	1 „	18 0	12 0	10 4	2,232				2	5 0	4 6	
	1 „	16 4	12 0	7 6	1,460				1	5 0	4 6	
Schoolmaster serjeant's room.	1 „	12 0	13 0	12 0	2,592				1			
Hospital serjeants' quarters in 2 rooms each.	1 „	10 10	14 10	14 4	2,303				1	4 0	3 6	
	1 „	12 10	14 10	14 4	2,732				1	4 0	3 6	
Apothecaries' quarters	1 „	11 10	14 10	14 4	2,526				1	4 0	3 6	
Regimental serjeant-major's quarters in 4 rooms.	1 „	13 10	16 10	12 6	1,641				1	5 0	4 0	
	1 „	13 10	16 10	12 6	1,641				2	5 0	4 0	
	1 „	14 0	8 0	7 8	256				1	4 0	3 6	
	1 „	8 0	8 0	7 8	88				1	4 0	3 6	
Regimental quartermaster serjeant's quarters in 3 rooms	1 „	24 0	17 0	9 10	3,912				4	5 0	4 0	
	1 „	13 10	17 0	9 10	2,205				3	5 0	4 0	
	1 „	38 3	12 0	9 7	4,414				2	5 0	4 0	
8 Serjeants' quarters in one range, 2 rooms each.	1 „	14 0	17 0	12 0	2,856				8	5 6	5 0	
	1 „	14 0	12 0	11 3	1,890							
Standard guard-room	7½	35 0	16 0	14 0	78,404				4	5 0	4 0	
2 Prisoner rooms, each		16 0	16 0	14 0	3,584							Ventilation near the top from iron bars in frames and edge ventilators.
2 Solitary cells, each		8 6	8 0	10 0	640							Ditto

Foot Artillery.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
		Ft. in.	Ft. in.	Ft. in.			Ft. in. Ft. in.			Ft. in.	Ft. in.	
2 Ranges, each	29	119 0	18 0	13 7	29,092	1,000	6 6 × 2 6	18 in. & 2ft.	7	5 6	4 6	
2 Serjeants' rooms in centre of the 2 ranges.	2	17 6	17 9	13 7	2,610				12	2 6	3 6	
									1	5 6	4 6	
									2	2 0	3 0	
1 Staff serjeants' quarters in 2 rooms.	1	16 0	14 11	11 6	2,749				2	5 6	4 6	
	1	10 0	14 11	11 6	1,720				2	5 6	4 6	
Guard room	4	25 0	14 4	11 3	4,030				3	5 6	4 6	
1 Prisoner room		16 6	14 0	11 3	2,598				1	5 6	4 6	
" "		27 0	8 0	7 3	1,566				2	2 0	3 0	
1 Solitary cell		8 0	8 0	10 0	640							Ventilation near the top from iron bars in frames and edge ventilators.
1 Conjee house		14 0	8 0	10 0	1,120							

By Officer commanding 1st King's Dragoon Guards.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
		Ft. in.	Ft. in.	Ft. in.			Ft. in. Ft. in.			Ft. in.	Ft. in.	
8 Ranges - - each	88½	201 0	20 0	22 0	88,440	1,000	6 6 × 2 6	18 in. & 2ft.	2 swing	3 0	3 0	6 Ranges completed, 2 under alterations.
At the ends of each range 4 serjeants' quarters in 3 rooms	2	13 0	18 0	17 6	4,095				38 "	1 6	3 0	
		11 0	18 0	17 6	3,445				18 "	8 0	4 0	
		9 9	18 0	17 6	1741				2	6 0	4 0	
2 Single serjeants' rooms each - -	2	12 7	18 0	17 6	3,902½				4 swing	1 6	3 0	
		12 0	18 0	17 6	3,780				1 "	6 0	4 0	
									1 "	1 6	3 0	
									1 "	1 6	3 0	
									2	6 0	4 0	
									2 swing	1 6	3 0	
									1	6 0	4 0	
									1 swing	1 6	3 0	
Regimental serjeant-majors and quartermaster-serjeants' quarters, 5 rooms each - -	2	18 0	21 0	18 0	6,804				14	6 0	3 9	
		10 0	21 0	18 0	3,780				14 swing	1 6	3 0	
		15 0	21 0	18 0	5,670							
		15 0	8 0	10 0	1,200							
		10 0	8 0	10 0	800							
8 Troop serjeants, majors, or colour-serjeants' quarters in 1 range, 4 rooms each - -	8	12 0	7 0	13 7	1,141				16	5 6	3 6	
		12 6	16 7	9 0	1,760				16	5 6	3 6	
		12 0	15 0	13 0	2,210				8	5 6	3 6	
		12 0	8 0	9 0	864							
3 Staff serjeants' quarters, 3 rooms each - -	3	14 0	15 0	17 0	3,570				2	6 0	4 0	
		12 0	15 0	17 0	3,060				4 swing	1 6	3 0	
		27 0	8 0	10 0	2,160				1	6 0	—	
									2 swing	1 6	—	
									1	4 0	3 0	
Armourer serjeants' quarters, in 3 rooms - -	1	12 0	15 0	19 6	3,580				2 swing	6 0	4 0	
		14 0	15 0	19 6	4,095				4	1 6	3 0	
		27 0	8 0	11 6	2,490				3	6 0	4 0	
									4	6 0	4 0	
									4 swing	1 6	3 0	
4 Serjeants' rooms at the east gate, each	2	28 0	22 0	12 0	7,392				2	3 6	3 0	
		8 5	22 0	12 0	2,220				1	4 0	3 0	
		9 9	11 0	12 0	1,284				1	3 6	3 0	
		9 10	10 0	12 0	1,176				1	3 6	3 0	
1 Librarian's room - -	1	17 8	9 8	10 6	1,848				31 swing	6 6	4 0	
Canteen serjeants' quarters, in 3 rooms - -	1	15 9	12 0	16 0	3,024				31 "	1 6	3 0	
		15 6	12 0	16 0	2,976				2	6 0	4 0	
		8 0	12 0	16 0	1,536				1 swing	1 6	3 0	
									1	6 0	4 0	
Schoolmaster serjeant's quarters, in 2 rooms - -	1	20 0	9 0	8 0	1,440				1	3 6	3 0	
		20 0	9 0	8 0	1,440				3	3 6	3 0	
Orderly room serjeants' quarters, in 3 rooms - -	1	12 0	24 0	19 9	5,688				6	4 0	3 6	
		12 0	12 6	17 6	2,520				2	6 0	5 0	
		12 0	12 0	17 6	2,520				2	6 0	5 0	
Family quarters, or rank and file, in 2 rooms each - -		16 0	14 0	14 0	3,136				1	5 6	3 6	
		9 0	9 0	9 0	729				1	1 6	3 0	
										4 0	3 0	

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Barrack Accommodation—*continued.*

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
GUARD ROOMS.		Ft. in.	Ft. in.	Ft. in.			Ft. in.			Ft. in.	Ft. in.	
1 At the Conjee dry rooms - Men's		25 5	18 0	15 9	7,197				46 swing	5 0	4 0	
" Serjeants'		8 0	8 0	15 9	948				1	1 6	3 0	
									1	5 0	4 0	
									2 swing	1 6	3 0	
1 Quarter or front guard room - Men's		50 0	20 0	22 6	22,500				4	6 0	5 0	
" Serjeants'		8 6	18 8	17 6	5,740				3 swing	1 6	3 0	
" Men's		25 0	16 0	13 0	5,200				4	4 0	3 0	
" Serjeants'		15 9	7 6	8 0	4,836				1	4 0	3 0	
1 Prison room at the front guard -		20 0	20 0	22 6	9,000				3	2 0	2 0	Ventilation on the top.
3 Ditto ditto		9 6	10 0	11 6	1,092				1	Frames with bars.		
2 Prison rooms at the Conjee dry rooms		24 0	18 0	18 6	6,993					18 in.	13 in.	
5 Solitary cells -		8 0	8 0	11 0	764							

By Officer commanding 1st Madras Fusiliers.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
Upper Square.		Ft. in.	Ft. in.	Ft. in.			Ft. in. Ft. in.			Ft. in.	Ft. in.	
Front range barracks, western end -	61½	272 0	18 0	12 6	61,200	1,000	6 6 | 2 6	18 in. & 2 ft.	31	5 0	4 0	
2 Serjeants' rooms at the gable end - each	2	10 0	9 0	7 6	675				1	4 0	3 0	
2 Serjeants' rooms at the end of verandah - - "	2	10 0	10 0	7 3	725				1	4 0	3 0	
Front range, eastern end -	56½	257 0	18 0	12 6	56,666⅔				29	5 0	4 0	
2 Serjeants' rooms at the gable end - each	2	10 0	9 0	7 6	675				1	4 0	3 0	
2 Serjeants' rooms at the end of verandah - - "	2	10 0	10 0	7 3	725				1	4 0	3 0	
Eastern range barracks -	113	503 0	18 0	12 6	113,165				55	5 0	4 0	
4 Serjeants' rooms at the gable ends - each	4	10 0	9 0	7 6	675				1	4 0	3 0	
4 Serjeants' rooms at the end of verandah - - "	4	10 0	10 0	7 3	725				1	4 0	3 0	
Western range barracks -	113	503 0	18 0	12 6	113,165				57	5 0	4 0	
1 Serjeant's room, northern gable end - each	1	19 0	10 0	7 6	1,325				1	4 0	3 0	
2 Serjeants' rooms, southern gable end - "	2	10 0	9 0	7 6	675				1	4 0	3 0	
4 Serjeants' rooms at the ends of verandah - - "	4	10 0	10 0	7 3	725				1	4 0	3 0	
4 Serjeants' rooms at the gable end of store room - "	4	10 0	9 0	7 6	675				1	4 0	3 0	
3 Towers as serjeants' rooms - "	3	10 0	10 0	7 2	717				2	3 6	3 0	
Serjeant-majors' quarters - 1 room	1	17 3	18 0	12 6	3,881½							
"		9 10	18 0	12 6	2,112				1	5 0	4 0	
"		32 0	10 0	7 2	1,293				2	5 0	4 0	
"		28 0	10 0	8 0	2,240				2	5 0	4 0	
Quarter-master-serjeants' quarters - 1 room	1	14 0	18 0	12 6	3,140				1	5 0	4 0	
"		10 0	18 0	7 6	1,350				2	3 6	3 0	
"		26 0	10 0	7 2	1,863				2	5 0	4 0	
"		26 0	10 0	8 0	2,080				2	5 0	4 0	
Centre Square.												
Eastern range barracks -	52½	233 0	18 0	12 6	52,426				23	5 0	4 0	
2 Serjeants' rooms at the end of verandah - each	2	10 0	10 0	7 3	725				1	4 0	3 0	
2 Serjeants' rooms, gable end - "	2	10 0	9 0	7 6	675				1	4 0	3 0	
Western range barracks -	52½	233 0	18 0	12 6	52,426				25	5 0	4 0	
2 Serjeants' rooms at the end of verandah - each	2	10 0	10 0	7 3	725				1	4 0	3 0	
2 Serjeants' rooms, gable end - "	2	10 0	9 0	7 6	675				1	4 0	3 0	
2 Towers as serjeants' rooms - "	2	12 0	14 0	9 0	1,512				2	4 0	3 0	
Hospital serjeants' quarters in 2 rooms - "	1	14 0	12 0	8 0	1,344				2	3 6	3 0	

Barrack Accommodation—*continued.*

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
		Ft. in.	Ft. in.	Ft. in.			Ft. in. Ft. in.			Ft. in.	Ft. in.	
Lower Square		14 4	14 0	13 0	2,608				2	5 0	4 0	
Canteen serjeant's room	1	12 0	10 0	7 6	800				1	4 0	2 0	
Huts for rank and file, 64 each, 2 rooms.		12 0	10 0	7 6	800				1	4 0	2 0	
GUARD ROOMS.												
Front guard room, serjeants'.	1	10 0	16 0	8 7	1,344				2	5 0	4 0	
Front guard room, men's.	5½	40 0	16 0	8 7	5,493				3	5 0	4 0	
Rear guard room		25 0	16 0	7 6	3,000				3	3 0	2 6	
PRISON CELLS.												
1 prisoner room at the front guard.		20 0	16 0	8 6	2,620							Free ventilation from edge ventilators.
1 room simple imprisonment.		28 0	18 0	12 6	6,300							Ventilation from iron bars in frames near the top, with weather boards over them.
1 Ditto ditto		14 0	18 0	12 6	2,650							
6 Solitary cells		8 0	8 0	11 0	764							

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) The windows of the barracks are on opposite sides, and open to inside. The Dragoon and Artillery barracks have verandahs 12 feet either side. The Infantry barracks, a verandah on each side 10 feet wide. The verandahs are never occupied as sleeping quarters by soldiers or other persons. The Dragoon and Horse Artillery barracks have jalousies and jhilmils to them but there are none to the others. 6. The bedsteads used are planks laid on wooden tressels. The bedding is good, and I can suggest no improvements, with the exception that iron bedsteads would be better than the wooden ones. 7. No reply to this query. 8. The ventilation in the different barracks varies considerably. In all new buildings, &c., there is both roof and floor ventilation; in tents there is none. Huts are not used in India. Generally speaking, the ventilation is sufficient to keep the air pure by night as well as by day, but some old buildings are defective. There are no means used in Bangalore for cooling the air of barrack rooms. 9. The barracks are constructed of stone and mortar, and bricks and mortar. The tents are made of strong country cloth. 10. The floors of the barracks are made of flags or of chunam. Some are raised from and others level with the ground. Being of stone or chunam, there is no passage underneath, though some of the floors are raised as much as three feet above the ground. 11. The material and construction of the barracks and tents are suitable to the climate, and I can suggest no improvement. The roads of the cantonment are under the Executive Engineer, the parades under the Deputy Assistant Quartermaster-General, and the whole is under the supervision of the officer commanding the division. When barracks require repairs, the officer commanding the troops occupying them applies to the Deputy Assistant Quartermaster-General of the division, who, with the sanction of the General commanding, orders the Executive Engineer to have them executed. Repairs are generally quickly done. European barracks are whitewashed once a year inside, and once every two years outside; but should it be necessary on sanitary grounds, it is done oftener. 12. No reply to this query. 13. All linen in India is washed by washermen, who do the work in their own houses, and in an efficient manner. 14. No reply to this query. 15. The privies, &c., are ventilated by roof ventilators, and are lighted at night by oil lamps hung from the ceiling. 16. All the barracks in Bangalore are drained through open drains. The distance of the outlet being the Ulsoor tank, varies, but in no case is more than half a mile. The drainage is sufficient to carry away the surface water, &c. &c., readily. Neither the barracks nor hospitals are damp. The drainage is quite sufficient; but the outlet, as before mentioned, is in a large tank, much used by the natives for all purposes. There are no cesspits in the station. The drainage from both the European and Horse Artillery barracks flows into the Ulsoor tank through open drains. 17. (*By Deputy Inspector-General of Hospitals, Mysore Division.*) The natural formation of the ground on which the cantonment is situated is so favourable to drainage, that there are no swamps or even (decidedly) damp situations within the bounds. The surface drains, &c., along the sides of the roads are quite sufficient to carry off what rainfall there is. The houses of the officers are scattered widely over a large extent of ground, and are built separately, each one in the centre of a moderate-sized garden or compound. The refuse and manure from these are perhaps not removed so regularly as is desirable, but they are from time to

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	time used in manuring the gardens, or carried off to the neighbouring country by the cultivators. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) The surface drainage is good, but all is unfortunately carried into the tanks, the water of which is, as I before stated, largely used for drinking purposes. Refuse is carted away to the country daily. 18. (*By Deputy Inspector-General of Hospitals, Mysore Division.*) The surface of the cantonment has become rather overgrown with shrubberies in the officers' compounds. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) The surface of the cantonment is kept free of all rank vegetation which might be injurious to health. (*By Deputy Inspector-General of Hospitals, Mysore Division.*) There are scarcely any old walls or hedges in the place which materially interfere with the ventilation. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) There are no old walls, hedges, &c. in the station. In the bazaar a good deal might be removed with decided advantage. 19. *By Deputy Inspector-General of Hospitals, Mysore Division.*) The cantonment of Bangalore has, according to a census in 1859, a population of 124,660 natives and 3,306 Europeans and East Indians. The native population is chiefly located in the general bazaar, and the villages of Ulsoor and Shoolay. The two former are close to the European barracks; the last is at a considerable distance. About three-fourths of the whole live in the bazaar, which is situated close to the north of the European Infantry barracks, and is a densely-crowded town, which has sprung up since the formation of the cantonment. This bazaar is situated on sloping ground, well adapted for drainage, and its main streets are lined on either side with open stone-built drains, but the various lanes are partly undrained. The main streets are of fair width, but generally the crowding of the houses must interfere with the general ventilation. Water is obtained from wells and tanks, and is generally sweet and good, though in some wells it is brackish, and in many there must now be organic impregnations by filtration from the surface. There are no public necessaries, the natives resorting to open spaces near for the purposes of nature. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) The sanitary condition of the bazaar is very bad indeed; there is neither sufficient ventilation nor drainage, and the water supply is not wholesome, owing to the amount of filth percolating into the wells from bad drainage. There are no latrines, and the houses are much too crowded. (*By Deputy Inspector-General of Hospitals, Mysore Division.*) A small scavenger establishment with carts is kept up to sweep out the street drains, &c., and remove the offal outside the town. Public necessaries have recently been ordered to be built. Tanneries and slaughter-houses to be removed to outside the town. A plan is being carried into effect for removing the sewage of the place by a large main drain to a distance, and for storing water in a tank above the town for the purpose of flushing this and other drains. A good deal might be done in increasing the number of drains, in building them properly, and in opening out the town by main and cross streets. Covered drains would not suit the circumstances of the climate or people. The native houses are built with the object of concealing the female inmates, so that the principles of ventilation are little attended to; but the climate admits of doors and windows being generally open, so that the want of a better construction is not so much felt. Many of the houses are of good size and well built, but more are low, small, and crowded together; and there are many more tiled or thatched huts. However dirty the neighbourhood of the houses may be, native habits cause the inside of them to be kept generally clean, though for the sake of the privacy of the women there are latrines in most of the better houses, and cows and other cattle are often kept inside the house enclosures. The latrines are either wells sunk in the ground, which are closed up when filled, and others opened, or small rooms adjoining the streets, occasionally cleaned, and the drainage from which is led into the open street drains; either being an objectionable arrangement. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) I have had to examine several native huts near the lines of the native regiments which are under my department, and in front of almost every door there was a dirt heap. These bazaars are all under the Superintendent of Police, who, I know, has long been trying to remedy the evil. (*By Deputy Inspector-General of Hospitals, Mysore Division.*)—Occasionally there may be a nuisance experienced in the Infantry barracks from the wind blowing over the native dwellings; but it must be rarely, as the bazaars are situated to the north-west of the barracks, whilst the prevailing winds are west and south-west, or east and north-east. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) Nuisance is experienced from this cause in the married men's huts of the Fusiliers. (*By Deputy Inspector-General of Hospitals, Mysore Division.*) The bazaars have originally been allowed to spring up too near the Infantry barracks enclosure, and now nothing short of the entire removal of one or other can prevent such occasional nuisance as may be experienced; but the nuisance may be modified by enforcing, as far as practicable, cleanliness in the native dwellings nearest the barracks. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) A bazaar is close by the barracks, and is crowded with the houses of men who keep buffaloes. The filth from these cowhouses flows into open drains, and in the dry season is very offensive. 20. (*By Deputy Inspector-General of Hospitals, Mysore Division.*) The slaughtering-places are situated at a considerable distance from the nearest part of the barracks, some 600 or 800 yards; but by the growth of the bazaars they have become enclosed in the centre of the town. They are daily cleaned out by a party of prisoners, but nevertheless are still rather offensive. Their removal to a place outside the town has been provided for. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) The slaughtering-place is in the centre of the bazaar, about half a mile from the European barracks. 21. (*By Deputy Inspector-General of Hospitals, Mysore Division.*)—There are no arrangements for stabling the bazaar horses, which, with other domestic animals, are kept in and about the houses of the inhabitants; but very few natives keep horses, and the few who do are comparatively wealthy, and their house enclosures large. The manure is sold or given to the ryots.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	(*By Deputy Assistant Quartermaster-General, Mysore Division.*) There are no arrangements for stabling horses. There are but few horses in the bazaar, and these being the property of wealthy natives, it is presumed they are housed in regular stables. 22. There are no stables for Artillery or Cavalry horses, which are picketed within 100 yards of the barracks. The dungheaps are some 200 yards distant; the manure is sold. The picketing-grounds are arranged in lines, about 100 yards distant from the men's quarters and the hospitals. (*Remark by the Commander-in-Chief.*) "After repeatedly urging the necessity of providing stables for the European mounted corps in this Presidency, sanction for their construction has at last been obtained, but no commencement has yet been made." (Signed) P. G. 23. (*By Deputy Assistant Quartermaster-General, Mysore Division.*) To the Dragoon barracks, soon to be occupied as an Infantry barracks, a sufficient number of married quarters is being built; some are already finished. In the Artillery barracks the allowed number is sanctioned. In the Infantry barracks the married quarters are insufficient in number and very bad, but this barrack is condemned, and to be given up in the course of two or three years. Some married people are located in barrack rooms, but none but married men are in these rooms, and the quarters of the different families are screened off. (*Remark by the Commander-in-Chief.*) "The disgraceful state of the Infantry barracks at Bangalore was earnestly brought to notice by me in my Report of September 1856, and after much pressure sanction was obtained for the erection of new barracks, but from the impoverished condition of the finances, and delays interposed by the Government of India, the works have proceeded very, very slowly, and fully another year must elapse before the buildings can be occupied. See also my inspection tour report, March 1858, head Bangalore." (Signed) P.G.
Officers' Quarters.	(*By Deputy Assistant Quartermaster-General, Mysore Division.*) There are no officers' quarters in Bangalore.
IV. Health of the Troops.	(*The following answers are given by the Deputy Inspector-General of Hospitals, Mysore Division.*) 1. The station of Bangalore is generally considered one of the most healthy for European troops in the Madras Presidency; the native population is also healthy. 2. The diseases most prevalent among natives in Mysore are intermittent fever, chiefly of the quotidian type, dysentery, diarrhœa, rheumatism, and hepatic disease; epidemic cholera occasionally occurs. 3. Bangalore is situated in one of the most elevated parts of the Mysore country, and is about 3,000 feet above the level of the sea. The climate is generally cool and agreeable, except in the hot months, March, April, and May, and is considered healthy. 4. The European troops at present at this station are Her Majesty's 1st Dragoon Guards, the 1st Madras Fusiliers, the head-quarters of the Madras Horse Artillery, and A. company, 3rd battalion Foot Artillery. For this and several other questions relative to the health of European troops, I must beg leave to refer to the reports of the medical officers in charge of those regiments. Her Majesty's Dragoon Guards have but lately arrived from England, and I believe were healthy while in Europe. The 1st Madras Fusiliers have lately returned from field service in Bengal, where they had been ordered to assist in quelling the mutiny of the Bengal native army in 1857–58. Very few of the men who left the Madras Presidency for that purpose have returned; the regiment now chiefly consists of new or fresh recruits who are scarcely yet acclimatized. The men's accommodation in this station is very good; the barracks formerly in use have been very much improved lately, and are now in excellent order. The hospital of the Dragoon Guards was objectionable in many respects, but it has lately been put in thorough repair. 5. The troops at this station have not been camped out. 6. I have not been in charge of troops at hill stations; I consider hill stations, such as the Nielgherries better adapted for a sanitarium than for the location of troops. 7. Troops returning to the plains from hill stations are more liable to hepatic diseases, dysentery, and relaxation of the bowels, and this is attributable in a great degree to the great change of temperature, to the change of water, and to the fact that the men are less careful in exposing themselves to solar influence. 8. I consider hill stations better calculated for sanitaria than for the location of troops. 9. On first going to hill stations, such as the Nielgherries or other hills at a higher elevation, 7,000 or 8,000 feet above the level of the sea, persons very often suffer from diarrhœa, relaxation of the bowels, and febrile attacks, unless they are particularly careful in adapting the clothing to the change of temperature. 10. The chief precautions to be observed at hill stations are the use of warm clothing, generous diet, regular exercise morning and evening, and avoiding exposure to the sun during the heat of the day. 11. Persons generally go to hill stations to avoid the extreme heat of the weather in the plains during the hot months. The shortest period of residence in the hills which would enable troops to obtain benefit to their health is 12 months. 12. Persons who have been for some time resident at hill stations, and who are acclimatized, may remain for an indefinite time with advantage, but they must feel the change of temperature more on returning to the plains. 13. For troops returning to the plains from hill stations, I would recommend avoidance of exposure to the sun during the heat of the day, and of the use of hard or unfiltered water, adapting the clothing to the change of temperature, and generous diet. 14. I consider that service in the plains, adopting every means to preserve the health of the troops, with short periods of change to hill stations, would be better calculated to keep them in a fit state for general service. I consider occasional change of stations in the plains beneficial in the absence of epidemic disease, such as cholera. Troops are generally very healthy on a line of march. 15. A barrack and hospital for one regiment have lately been built at Jackatalla, a station in the Nielgherry hills, now called Wellington. I understand that in future it is to be used as a sanitarium for troops serving in the plains. 16. The most suitable sites for hill stations would be between 3,000 and 6,000 feet above the level of the sea.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	17. The Nielgherry hills are chiefly used as a sanitary station for troops serving in the Mysore division. They are about 170 miles from Bangalore, and can be easily reached by transit coaches. The climate is cool and bracing, and very agreeable, except in the monsoon or rainy season. 18. The black loamy cotton soil, such as is frequently found in the ceded districts, is considered unhealthy, but I am not aware that it is more so than others. 19. The best age for a soldier to proceed to India is about 20 or 21 years of age, and he should land there between the months of October and March. On first landing troops are generally located in Fort St. George, Poonamallee, or Palaveram. The barrack accommodation is good, the troops are well clothed and attended to, and not overworked. Recruits should be instructed to avoid exposure to the sun in the heat of the day; their clothing should be adapted to the climate; they should be regularly exercised morning and evening, but not overworked, and a good generous diet be provided for them. 20. I should think that a residence by troops at an intermediate place, before being sent to India, for a certain time would be desirable. If troops could be sent to hill stations on landing, and gradually accustomed to the climate, it would be a very good plan, but this cannot be always adopted. 21. Troops formerly marched to the different stations; they now usually travel to the interior by railways, transit coaches, &c. when practicable. 22. From my experience I consider the term a British soldier should serve in India should be 24 years. 23. The manner of conducting medical boards is at present very satisfactory. 24. Invalids should leave India for home in the months of January and February.
Diseases.	1. There are regular inspection parades for the discovery of incipient diseases once a week at this station. 2. There is no scorbutic disease now existing among the troops at this station. 3. During the year 1859-60 the admissions out of a strength of 1,425 from hepatic disease occurring amongst the Europeans were one in 25 of the whole strength, and of these three died. The frequency of the disease is attributable in some degree to the great variety of temperature occurring in the 24 hours. The measures which, in my opinion, would diminish its frequency are,—temperance in the use of spirituous liquors, attention to clothing, avoidance of exposure to the sun during the heat of the day and to the cold heavy dews of the early morning, and a good and generous diet. 4. There has been no case of dracunculus amongst the European troops during the year 1859-60. 5. The proportion of sick from venereal disease to the total sick in hospital from all other diseases is fully one half. Lock hospitals have been lately established at the principal stations occupied by European troops, and it is to be hoped that much benefit will be derived from them, if properly and judiciously conducted. 6. The admissions and deaths from fevers, dysentery, cholera, small-pox, and rheumatism are shown in the following table. The proportion which the admissions from these diseases bear to total admissions is about one-fourth.

Diseases.	Admissions.	Deaths.
Fevers:		
Intermittent, quotidian type	109	0
Tertian fever	9	0
Remittent „	4	2
Continued „	26	2
Dysentery, acute	55	1
„ chronic	1	0
Cholera	11	3
Small-pox	5	1
Rheumatism, acute and chronic	140	0

	7. The only zymotic disease which occurred was variola, four cases of which occurred in the 1st Madras Fusiliers, and one in the 1st King's Dragoon Guards, in the months of March and April. The sanitary condition of the barracks, &c. is good, but immediately in rear of the Fusilier barracks is the bazaar, in which are several tanneries, a slaughter-house, and other nuisances, which have been recommended to be removed. The Europeans are generally clean and healthy, but the natives are not so particular in this respect. 8. I should not suppose that the nature of a soldier's duties or occupation in barracks, which are kept clean and well ventilated, and not over-crowded, would tend to the production of epidemic disease. These diseases do occasionally occur, but it is sometimes very difficult to account for their prevalence. 9. There has been no opportunity of trying quinine as a prophylactic at this station, but it has been tried on a line of march through a jungly district, and, I believe, with good results. 10. For the prevention or mitigation of epidemic disease, I should recommend the frequent use of quicklime to drains, privies, &c., and if sulphate of iron and alum could be obtained, this might also be used with advantage in moderate quantity; and further, baskets of charcoal placed in all latrines, &c. for the absorption of gases, as it has been found to correct effluvia, and particular attention to cleanliness in every respect.
V. INTEMPERANCE.	1. (*By Officer commanding Artillery.*) The soldiers at the station are usually temperate, under existing restrictions. (*By Officer commanding 1st King's Dragoon Guards.*) I consider the soldiers of the King's Dragoon Guards, generally speaking, are of temperate habits. (*By Officer commanding 1st Madras Fusiliers.*) The Madras Fusiliers are temperate; unquestionably temperate considering the temptations they are exposed to; but in India temperance is the exception and intemperance the usual habit of the European soldiers, who become rapidly demoralized by their residence in this climate, by the idle, listless, objectless lives they are in a measure compelled to lead. But Government is much to blame; it places the poisoned chalice to their lips, bids them drink freely, and when the pernicious habit of swallowing

References to Subject and Queries	Replies.
V. Intemperance—*cont.*	raw spirits is confirmed, denounces them as a disgrace to their country, their religion, and their humanity. (*By Officer commanding Artillery.*) The proportion of confirmed drunkards is small, not more than 5 per cent. (*By Officer commanding* 1*st King's Dragoon Guards.*) There are two men in the regiment under my command confirmed drunkards out of 646 men. (*By Officer commanding* 1*st Madras Fusiliers.*) The average proportion of confirmed drunkards may, I think, be estimated at 1 per cent. of those who have been one year in the country; 2 per cent. of those who have been two years in the country; increasing throughout in a similar ratio to the period of residence in the country. 2. (*By Officer commanding Artillery.*) The average proportion of admissions to strength from diseases caused by intemperance during the past year has been 12·59 per cent. Directly - - - - - - - - - 10·37 per cent. Indirectly - - - - - - - - 2·14 per cent. (*By Officer commanding* 1*st King's Dragoon Guards.*) The proportion of admissions from diseases caused by intemperance has been about one in 70 in the year. (*By Officer commanding* 1*st Madras Fusiliers.*) During the last year, 1859, there were nine admissions from drunkenness and one from delirium tremens. It is impossible to state numerically, with any approach to accuracy, the number of admissions from diseases caused indirectly or aggravated by intemperance, as other causes are in operation, but the injury done to the health of soldiers by immoderate indulgence in ardent spirits is obviously very great. (*By Officer commanding Artillery.*) The following table shows the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station.

—	Teetotalers.	Temperate.	Intemperate.
Average strength for past year 135 -	3	114	18
Average amount of admissions - -	0·33 per cent.	11·40 per cent.	22·2 per cent.
„ „ mortality - -	None.	1 in 114, or 0·87 per cent.	None.
„ „ crime - - -	None.	1 in 14¼, or 7·9 per cent.	1 in 1⅓ men.

(*By Officer commanding* 1*st King's Dragoon Guards.*) No record of the number admitted into hospital under this head has been kept, but I should say, directly and indirectly, intemperance is the cause of at least one-sixth of the admissions. No correct statistics have been kept to prepare a table of this kind.

(*By Officer commanding* 1*st Madras Fusiliers.*) Data do not exist with which to construct a statistical table in which confidence could be placed. There are few totally abstinent men, and the classes of temperate and drunkard are not sufficiently defined to admit of showing statistically the results in each class, as respects sickness and mortality. Thus much may be stated with the utmost confidence, viz., that drinking to excess of ardent spirits is, directly or indirectly, literally the root of all evil in the army. It is the cause of more than nine-tenths of the crime, and its influence on health and morals is hardly less destructive.

(*By Officer commanding Artillery.*) Drunkenness is always punished as an offence.

(*By Officer commanding* 1*st King's Dragoon Guards.*) Drunkenness is always punished as an offence.

(*By Officer commanding* 1*st Madras Fusiliers.*) Drunkenness is considered one of the greatest crimes commited by a soldier, and is always punished. It is the parent of almost every crime committed by the European soldier. It is considered a minor crime *per se*, and is punished as such. Deducting entries for drunkenness, and crimes committed under its baneful influence, I doubt if any army in the world could exhibit such a moderate defaulter sheet as the British army.

3. (*By Officer commanding Artillery.*) Distilled spirits are sold both in the canteen and in the bazaar, but illegally in the latter, and the spirit there sold is very inferior.

(*By Officer commanding* 1*st King's Dragoon Guards.*) Arrack is sold in the canteen of the King's Dragoon Guards. The daily quantity for each man is one dram.

(*By Officer commanding* 1*st Madras Fusiliers.*) The men are allowed only a certain quantity of spirit in the canteen, but any quantity of an inferior description can be obtained in the bazaar. Unfortunately spirits are sold in canteens even in garrison, and this practice should be discontinued, if the welfare of the soldier is really an object of anxiety to Government. Spirit rations mixed with three parts water might be issued on actual service; but the issue of raw spirits to the soldiery in garrison is justified by no valid consideration of economy or expediency. The normal state of man is a craving for stimulants. In the savage, as in the civilized man, this craving has developed itself, and has in every country in the world been gratified by deleterious drugs and liquids. It is the part of a civilised government to devise means to check and not pamper this morbid appetite; but to issue raw spirits to the soldiers, and to encourage its consumption by authorizing its unchecked sale in every street, and in every bazaar in a large military station, as is the case at Bangalore, is a short-sighted policy, subtracting from the revenues by the non-efficiency of its soldiers, by their premature decay, and by their rapid consumption ten times the amount realized by the unchecked sale of spirits.

(*By Officer commanding Artillery.*) At the canteen two drams of spirit is the allowance per man, or one dram with one quart of malt liquor or two drams of wine. Four drams of wine is the limit in wine, but then no arrack is allowed.

(*By Officer commanding* 1*st King's Dragoon Guards.*) The quality of the arrack is good, and the amount consumed per diem by each man one dram, with the exception of those who do not drink arrack.

(*By Officer commanding* 1*st Madras Fusiliers.*) The quality of the spirit sold in the canteen is good; but that sold in the bazaar is generally very bad. The average spirit consumed by each man is one dram per diem from the canteen. If the quality of any spirit can be said to be good, the spirit sold in the canteen may be called so. It is impossible to guess what amount is really consumed by each man per diem. The fear of punishment, but no moral control, checks its consumption. The canteen allowance is limited, but the bazaar supply is inexhaustible. No restraint is placed on the men leaving their barracks between morning and evening gun-fire. The probability is that not three men in five go to bed perfectly sober; and when pay is issued, or funds available, not two in five are completely free from the influence of liquor. Total abstinence is unknown.

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References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	(*By Officer commanding Artillery.*) It is not a habit in quarters with the men to take a dram before morning parade, even had they the choice, which they have not, as no spirits can be sold in the canteens before half-past 1 p.m.; but on the line of march, I am of opinion that the issue of a dram on arrival in camp, and before the men turn out to stables, would be beneficial, as it would help to keep them from drinking bad water, and the stuff sold as fire Chilli water and toddy. (*By Officer commanding 1st King's Dragoon Guards.*) It is not a habit among the men of the regiment under my command to take a dram before morning parade, and I believe that almost every man has a cup of coffee and a biscuit before morning parade or drill. (*By Officer commanding 1st Madras Fusiliers.*) It is not a habit among the men of my regiment to take a dram before morning parade, as no liquor can be purchased from the canteen before 11 a.m. Two drams of raw spirits are a recognized portion of the soldier's ration, which he can claim, whether in garrison, on the march, or in the field, by paying for it. A regimental order prohibits the canteen being opened for the sale of spirits till 11 a.m., but the habit of the European soldier is to take raw spirits at any time when he can get it, whether it is early morning, noon, or night, and the unquestionable effects of this habit are loss of health, loss of character, and premature death. (*By Officer commanding Artillery.*) Spirit is never given as a ration to convalescents. (*By Officer commanding 1st King's Dragoon Guards.*) Spirits are not given as a ration to convalescents; but some of them in barracks doing light duty are permitted to draw their allowance of beer from the canteen. (*By Officer commanding 1st Madras Fusiliers.*) No convalescent list is kept in hospital; that is, patients are not discharged (and therefore remain on hospital diet) till able to perform their duty. (*By Officer commanding Artillery.*) Soda water, lemonade, and ginger beer may be sold in the canteen, and coffee also, none of which are injurious to health when properly made at the canteen under my command. Coffee only is sold at present. (*By Officer commanding 1st King's Dragoon Guards.*) No drinks other than intoxicating drinks are sold at the canteen under my command. (*By Officer commanding 1st Madras Fusiliers.*) In the bazaars very many drinks are sold that are most injurious to health, poisonous in quality, and maddening in their effects. Ginger beer, spruce beer, soda-water, and lemonade are procurable in the canteen. Tea and coffee in the coffee shop. 4. (*By Officer commanding Artillery.*) As a general practice, the consumption of spirits is injurious to health. (*By Officer commanding 1st King's Dragoon Guards.*) A moderate use of spirits is conducive to health in more than the majority of mankind. The absence of it is no doubt injurious to health. (*By Officer commanding 1st Madras Fusiliers.*) The consumption of spirits by troops and convalescents (more especially in tropical countries) is decidedly injurious to health, excepting in particular and rare circumstances, such as when exposed to rain and fatigue on field service. (*By Officer commanding Artillery.*) The consumption of spirits is conducive to the efficiency and internal discipline of the corps, when kept within due limits. (*By Officer commanding 1st King's Dragoon Guards.*) I look upon spirits as conducive to the efficiency of the corps when employed on arduous and laborious duties, as a stimulant to exhausted nervous prostration, frequently met with on active service. As to its being conducive to internal discipline, I do not think it is. (*By Officer commanding 1st Madras Fusiliers.*) If the men could be restricted in the quantity of spirits they are permitted to obtain at the canteen, and not be able to procure it in the bazaar, I consider the quantity allowed would not be the cause of detracting from the efficiency or internal discipline of the corps. But, as the case stands, the unrestricted sale of every species of intoxicating drug and liquor being authorized and encouraged by Government, the efficiency and discipline of the corps are maintained with difficulty. 5. (*By Officer commanding Artillery.*) It would not be conducive to further restrict the sale of spirits at canteens than the present regulations provide for; any measures that could be taken to abolish their sale in bazaars would certainly be advantageous. Spirituous liquor is not and has not been issued as part rations to European troops of the Madras army since November 1836. *Vide* General Order, No. 243, November 22, 1836. (*By Officer commanding 1st King's Dragoon Guards.*) I do not think spirits should ever form part of the ration of a soldier, and it would be conducive to health to do away with it as a regular ration, particularly on board ship, where often the young soldier gets habituated to what he does not require; but on active service, in an unhealthy country, I think one or two drams daily would be conducive to health and to the efficiency of a corps. The small amount of spirits allowed to the men (optionally) in a well-regulated canteen can never produce any harm, and may be beneficial to many, but it is different in the bazaar, where any quantity of the worst kind of liquor can be had for a very small sum, only eight annas (one shilling) the quart bottle, and decidedly the sale of it should be abolished in all bazaars in India where European troops are located. Many young soldiers have attributed their illness to the drink they got in bazaars in nearly these words:—"I took a walk out, "and I felt thirsty, and was induced to take some arrack in the bazaar. It tasted very weak, "and I drank nearly a bottle of it, but I soon felt it overcoming me, and I did not recollect "anything more, till I awoke with a headache three or four hours after, and with a burning "in the throat." (*By Officer commanding 1st Madras Fusiliers.*) To restrict the sale of spirits in the canteens would be of little advantage so long as abundance is procurable elsewhere, and to limit the quantity in bazaars is impracticable. There appears to be but one remedy for the total prevention of drunkenness, and that is the entire suppression of the distillation and sale of spirits. Half measures will not do—one glass only creates a stronger desire for a second, and so on. Experience proves that the depraving and demoralising vice of intemperance cannot be cured by temporising measures. In England the carrying out of the preventive plan recommended might meet with powerful opposition, but in India the principal objection would be the injurious effects it would produce on the revenue. If ardent spirits be sold, English soldiers will obtain them in some way or other, and drink to excess. The canteen and the liquor shop possess far stronger attractions for the soldier generally than the library;

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	and so long as spirits are obtainable in such abundance, all attempts to substantially improve and elevate the character of the soldier will be but partially successful. 6. (*By Officer commanding Artillery.*) A moderate use of malt liquor or wine is calculated to produce a beneficial influence on the health of the men as compared with spirituous liquors. (*By Officer commanding 1st King's Dragoon Guards.*) The use of spirits, wine, or beer can be abused; but the moderate use of any one, or all is wholesome. As a general rule the free use of malt liquor is less likely to do harm, and would be the most agreeable and wholesome beverage in a hot climate. (*By Officer commanding 1st Madras Fusiliers.*) In my opinion malt liquor in moderation, as a general rule, is beneficial to health, whereas ardent spirits are prejudicial. 7. (*By Officer commanding Artillery.*) Lemonade, soda-water, &c. are not much used under my command; but tea and coffee are, the latter chiefly in the morning before going to drill. (*By Officer commanding 1st King's Dragoon Guards.*) The men of my regiment use a great quantity of tea, coffee, and ginger beer, especially in the hot season. (*By Officer commanding 1st Madras Fusiliers.*) Coffee, tea, and ginger beer are much used, but lemonade and other drinks not so much, partly because they are beyond the soldiers' means, but chiefly because they are devoid of the stimulus a vitiated appetite craves that has early in life been innoculated with the pernicious habit of drinking raw spirits. To such an extent does this morbid appetite for stimulants prevail, that old soldiers are in the habit of adding to their rations of raw spirits both spices and Chilli seeds to improve its strength. Spirits diluted with water would be rejected by such men as liquor that had been spoilt and not fit to be drunk. (*By Officer commanding Artillery.*) As compared with the temperate use of spirits or beer, coffee, tea, &c. &c. are of no advantage to health or discipline. Comparative yearly statements showing the ratio of disease and death among temperate and teetotal men corroborate this opinion. (*By Officer commanding 1st King's Dragoon Guards.*) I believe that the men who take the least drink are in every way the best as regards their own comfort. They are seldom sick or in confinement, though I do not think that the quantity allowed to each man (one dram of arrack and one quart of beer or porter), as it is given to them, can have any effect on the efficiency and discipline of the corps. (*By Officer commanding 1st Madras Fusiliers.*) There can be no question of the incalculable advantages as regards health, efficiency, and discipline that would accrue from the substitution of tea, coffee, lemonade, &c. &c. in lieu of raw spirits. Beer and porter, in moderation, I believe to be wholesome and unobjectionable drinks. 8. (*By Officer commanding Artillery.*) No spirit *ration* is allowed or has been for the last 24 years in the Madras army. *Vide* General Order O. G., 22nd November 1836. Compensation instead of spirit ration is included in the monthly pay of all ranks. (*By Officer commanding 1st King's Dragoon Guards.*)—The climate at Bangalore is frequently cold and damp, and I do not think that the quantity of drink allowed by regulation is the least injurious to health. I think the suppression of it altogether would have a bad effect, as no doubt the men would obtain it surreptitiously in the bazaar, and the drinks sold by the natives are, generally speaking, of a bad quality and pernicious to health. On the whole it would be beneficial to suppress altogether the use of spirits as a ration in the station, and to substitute beer, tea, and coffee. The only time that I think spirits may be required is on active service, and it is more easily carried than beer. (*By Officer commanding 1st Madras Fusiliers.*) If the distillation and sale of spirits at the station were entirely suppressed, the spirit ration discontinued, and beer, coffee, and tea substituted, the influence on the health of the troops would be decidedly beneficial. 9. (*By Officer commanding Artillery.*) It would not be beneficial to prohibit the sale of spirits in the canteen, as it would be impossible to put a stop to men getting spirituous liquors somewhere when prohibited in the canteen. I made the experiment of having no spirits in the canteen at Jaulnah for nearly four years, but found those men who got drunk generally procured it in the bazaar; and there was a constant wish, even among the best behaved men, to be allowed arrack in the canteen, particularly in wet or damp weather during the monsoon. (*By Officer commanding 1st King's Dragoon Guards.*) The small quantity of spirits allowed in a well regulated canteen can do little or no harm. It is the immoderate use of spirits in the bazaars that should be stopped, where men, heated in the middle of the day, will drink anything that offers, be it never so bad. Where beer is to be had at a moderate price in the canteen, little or no spirit is ever called for by the soldiers, as they nearly all prefer beer to spirits. (*By Officer commanding 1st Madras Fusiliers.*) It would be beneficial to prohibit the sale of spirituous liquors in the canteen, provided they were not obtainable elsewhere, but not otherwise. 10. (*By Officer commanding Artillery.*) I would suggest that, on the line of march the issue of one dram be allowed before the men turn out to stables on reaching new camp ground. I would suggest that all tobacco for the use of the men (*bonâ fide*), and sold in canteens, be allowed to them free of duty. I would suggest that every facility and encouragement be afforded to regiments to establish for the use of the men gymnasia and games, such as cricket, foot-ball, &c., and that fives courts be erected in every regimental lines. At stations near which there is no river, swimming baths might be built. I am of opinion that attached to the gymnasia there might be a school of arms, and that encouragement might be more generally given to the practice of sword exercise, single stick, and fencing among the men, especially those of the mounted branches of the service. (*By Officer commanding 1st King's Dragoon Guards.*) I would recommend that no abkary licences should be issued to natives by Government in any cantonment where there are European troops, or within 10 miles of it, and the sale of the worst kind of liquor will be prevented. (*By Officer commanding 1st Madras Fusiliers.*) I would urgently recommend the discontinuance of spirit rations except when on actual service, and even then I would exact that all spirits issued to troops be mixed with three parts water. I would continue canteens in regiments, but while in garrison or on the line of march no spirits should be allowed in them, but only beer, porter, ginger and spruce beer, soda-water, lemonade, and other harmless drinks, with tea and coffee. I would convert the canteen into a club house, furnished with chess and backgammon boards, dominoes, billiard and Sinclair tables. It should be located

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	within an extensive piece of ground planted with shady trees, with open glades for quoits and cricket, containing skittle alleys, a fives court, a racket court, an extensive workshop, a good library, and a large piece of water. 11. (*By Officer commanding Artillery.*) General rules for canteens as laid down by the G. O. C. C., 17th August 1855, are strictly adhered to. (*By Officer commanding 1st King's Dragoon Guards.*) The following copies of the canteen and coffee-room regulations are properly obeyed by the troops:— "REGULATIONS FOR THE COFFEE-ROOM. "The coffee-room having been instituted for the recreation of those men who are desirous of spending their leisure hours in reading and quiet amusement, all noisy conversation, bad language, and gambling with cards or dice are strictly forbidden. Chess, draughts, and dominoes are allowed to be played, but wagers or bets on these games are prohibited. "A number of papers and periodicals are provided from the fund for the use of the men, and the non-commissioned officer in charge is held responsible for their safe custody. "Any man damaging or destroying any journal &c. will have to pay its full value. "Coffee, tea, &c. will be provided at the following prices, and will be in readiness from 4·30 a.m. until a quarter to 8 p.m. Coffee, per cup - - 4 pies. Tea, do. - - - 4 „ Biscuits, each - - 1 „ Cheroots, do. - - - 1 „ Ginger beer, per bottle - 8 „ "All articles to be paid for on delivery. "The serjeant on duty for the day at the canteen will frequently visit the coffee-room to preserve order and regularity, and will immediately report any breach of the same. "The canteen serjeant will exercise a general superintendence of the coffee-room, and will see that the premises are kept perfectly clean. "The coffee-room will be cleared every evening at a quarter to 8 o'clock, and will not be opened after that hour upon any pretence, without competent authority. "The orderly serjeant-major and serjeant will see it cleared as heretofore, and continue to certify the same in their reports." True copy. (Signed) J. NISBET, Major, King's Dragoon Guards. "REGULATION FOR THE CANTEEN. "King's Dragoon Guards, Fort St. George, 13th November 1857. "The Right Honourable the Governor in Council is pleased to cancel G. O. G. noted in the margin, and to notify that the issue of malt liquors will from the 1st March 1858 be regulated by the imperial measure. The price of malt liquor issued by the imperial measure will be at three annas per quart, or one anna and a half per pint, and no man is allowed to purchase more than one quart daily, and only one dram of arrack in addition. No spirits are to be issued on any occasion before the usual dinner hour; no man is to be allowed more than one quart of malt liquor and one dram of spirits per diem, and these are never to be issued at the same time. When there is no malt liquor, one dram of spirits will be allowed in lieu thereof." (*By Officer commanding 1st Madras Fusiliers.*) The canteen regulations are contained in the General Orders of the Army, page 379 of 1855, and General Order, 17th August 1855, which are strictly carried out. There are no private rules.
VI. DIET.	1. (*By Officer commanding Artillery.*) The rations consist of the following, viz.:—1 lb. bread, 1 lb. meat (five days beef and two days mutton), 4 oz. rice, 1⅘ oz. coffee, 2 oz. sugar, 1 oz. salt, ⅘ oz. tea, and 1 lb. potatoes, to each man. Coffee and tea are issued alternately. Married men draw their tea, coffee, rice, and sugar once, or at some stations twice, a month. (*By Officer commanding 1st King's Dragoon Guards.*) 1 lb. bread, 1 lb. meat, 4 oz. rice, 2½ oz. sugar, ⅘ oz. tea, or 1⅘ oz. coffee, 1 oz. salt, and 1 lb. vegetables (potatoes). (*By Officer commanding 1st Madras Fusiliers.*) Mutton or beef, bread, tea or coffee, sugar, rice, salt, and vegetables. (*By Commissariat Officer.*) Bread 1 lb., meat 1 lb. (mutton twice a week, beef five times), rice 4 oz., sugar 2½ oz., firewood 3 lbs., salt 1 oz., tea ⅘ oz., coffee 1⅘ oz., and vegetables 1 lb. The rations are inspected daily previous to issue by a warrant or non-commissioned officer of the Commissariat department, and by the executive officer at uncertain periods during the month. (*By Officer commanding Artillery.*) The officer of the day inspects the rations every morning when issued, and at 1 p.m. when the men in barracks dine. (*By the Officer commanding 1st King's Dragoon Guards.*) An inspection of the ration is made once during the week by the commanding officer, and every morning by the orderly officer and quartermaster. (*By Officer commanding 1st Madras Fusiliers.*) The rations are drawn by the orderly corporal of each company, and the orderly officer on duty attends and inspects the rations. If they are reported bad by the corporals to the orderly officer, he reports the same to the officer commanding the regiment, and a committee is immediately assembled to reject them or otherwise, a medical officer being always on the committee. 2. (*By Officer commanding Artillery.*) Fruit is never provided for the troops. The stoppages from each man of all ranks is daily 3 annas 4 pies. There are three meals a day in quarters, and on the line of march two generally; the first meal in quarters is at 8 o'clock a.m., second at 1 p.m., and the third at 6 p.m. On the march it all depends upon the time of arrival in camp; with artillery men, their first meal is after morning stables, say 10 or 11 o'clock, and second at 6½ p.m. 1 lb. of vegetables is allowed for each man when procurable. (*By the Officer commanding 1st King's Dragoon Guards.*) A complete ration is provided at all times for the troops; the vegetables consist of 1 lb. of potatoes. No fruit is provided, nor does it belong to a soldier's ration, but the soldiers frequently buy fruit and other vegetables besides potatoes. The stoppages 3 annas 4 pies per diem. They breakfast at 8.30 a.m., consisting of tea or coffee and a portion of a pound of bread. Dinner at 1 o'clock, and in the evening at 6 o'clock tea or coffee.

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VI. Diet—*cont.*	(*By the Officer commanding* 1*st Madras Fusiliers.*) A complete ration is provided daily at a cost to the soldier of 6*r.* 5*a.* 4*p.* per mensem. There are three meals a day. Breakfast at 8½ a.m., of bread, tea, and meat; dinner at 1 p.m., of bread, meat, vegetables, and curry and rice; and tea at 6 p.m., of bread and tea; 1 lb. of vegetables is allowed per man. (*By the Commissariat Officer.*) 1 lb. of vegetables is issued daily, consisting of potatoes, brinjall, carrots, onions, pumpkins, &c., according to the season. No fruit is provided at this station; the stoppage for the rations is 3 annas 4 pies per day. The troops have three meals a day, breakfast at 8, dinner at 1, and supper between 5 and 6, consisting of the articles enumerated. 3. (*By the Officer commanding Artillery.*) The men complain that the supply of 1 lb. of bread per diem is insufficient. They should also have 1 ounce of tea instead of as at $\frac{5}{7}$ oz. No man has any opportunity or inducements to sell his rations. (*By the Officer commanding* 1*st King's Dragoon Guards.*) A ration of salt meat and biscuit should be issued to all the troops in garrison once a week; 1st, because I think it would be wholesome, and the men would like it; and 2nd, because a stock of those two articles should be always ready in every station, so that they might be issued to the troops at any moment. It has frequently happened that the bread or meat supplied to the troops has been condemned as bad and unfit for issue, and the soldiers have been kept without the rations till 4 or 5 o'clock in the afternoon; even then, as a better ration could not be procured, condemned and unwholesome rations have been obliged to be issued. This might be avoided if biscuits and salt beef or pork were kept good in store by an issue of one day's ration of these articles in a week and a fresh stock would be always on hand in store. The orderly corporals of troops receive the rations from the quartermaster, and they are by them given over to the cooks. These corporals superintend the cooking and division into messes of the rations, and are held responsible that no person purloins any portion of them. It is their duty also to see that the cook-houses and utensils are kept thoroughly clean. (*By Officer commanding* 1*st Madras Fusiliers.*) The great defect in the rations, and especially at Bangalore, is their being supplied of an inferior description. Both beef and mutton here are bad, and the bread is generally sandy. The quantity of rations is not sufficient for young and growing lads (recruits); they provide an additional supply privately. The rations I consider just sufficient for the men. No part is ever disposed of; no complaint of the disposal of rations has ever come to my notice. As there are from 10 to 20 or more men in each mess, any disposal of rations would unquestionably be complained of if detected. (*By the Commissariat Officer.*) All improvements in the rations, it is presumed, would be conducive to health. So far as I know, there is no arrangement for the prevention of any part of the ration being disposed of by the soldier, but it is presumed he would not be permitted to sell his rations with the knowledge of his commanding officer. 4. (*By the Officer commanding Artillery.*) The cooking places are very bad. It would be advisable to introduce Captain's Grant's cooking fire, as it would be cleaner and more economical in firewood, and more efficient in every way. The cook-houses or kitchens are very ill ventilated, dark, and small, and dirty from want of ventilation. The food is generally cut up and boiled into stew or curry for dinner, but in the morning the meat used by the men is fried. Cooking is very indifferent. Coffee is well prepared, better than tea, of which the allowance is small. The men have coffee on the march. (*By the Officer commanding* 1*st King's Dragoon Guards.*) The means and apparatus for cooking available: 1 copper boiler, 9½ gallons; 1 ditto, 6½ gallons, and 1 frying-pan for cooking for every 25 men. The kitchens are cleaned after every meal; they are indifferently lighted and ventilated. Cooking is done to the satisfaction of the men, and sufficiently varied, and the tea and coffee properly prepared. A sufficiency of water is supplied by the puckallies. The food is sometimes boiled, and at other times roasted. In fact, each man has his food cooked to suit his own taste. The men of the King's Dragoon Guards when on a march invariably have coffee and biscuits provided for them previous to leaving the encampment. (*By the Officer commanding the* 1*st Madras Fusiliers.*) Cook-rooms are attached to the barracks, and cooks are provided on application at the Commissariat department, or supplied by captains of companies. The rations are cooked in metal vessels supplied by Government, and in earthenware chatties purchased by the respective mess funds. The kitchens are kept as clean as the habits of the native cooks will admit of, but they are not sufficiently roomy or sufficiently ventilated. The smoke escapes through small apertures in the side walls, or through the upper part of the roof, portions of which are raised a few inches above the rest for this purpose. The supply of water is totally inadequate for cookery and cleanliness. It is brought by the puckallies from a considerable distance. The water of the only well in the barracks square is brackish. The food is sometimes boiled, sometimes roasted, according to the wish of the soldiers. The men always have tea or coffee before marching. The rations are sufficiently cooked, and the tea is also properly prepared. A coffee shop is located within the barracks square, where good coffee is procurable. A contract is granted by the commanding officer to any one—generally a native—who offers the best terms. (*By the Commissariat Officer.*) Copper boilers, frying-pans, and gridirons are supplied by the Commissariat department for cooking purposes. It is believed the kitchens are kept clean, but it is stated that they are badly lighted and ventilated, and that there is an insufficient supply of water. The food is boiled, roasted, stewed, and fried, I believe. The cooking is entirely under regimental arrangement, but is believed to be good and varied (as above stated). It is also understood that the tea and coffee, which are both good in themselves of their respective kinds, are properly prepared. In most regiments arrangements are not only made for these articles (generally coffee) being issued to the men before marching, but also for a supply on the march itself, generally half way, if practicable. 5. (*By the Officer commanding Artillery.*) It would be difficult to find suitable ground at Bangalore for soldiers' gardens, the lines being filled up with buildings. To encourage men to work in gardens, they must be left entirely to themselves. Any regulations would prove irksome to them. (*By the Officer commanding* 1*st King's Dragoon Guards.*) There is no ground near the cavalry barracks that could be advantageously converted into gardens. (*By the Officer commanding* 1*st Madras Fusiliers.*) Gardens for the cultivation of vegetables by soldiers could not be advantageously established near the station, every spot of ground

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VI. Diet—*cont.*	being crowded with houses. There is no available ground near the barracks for gardening, and unless the ground is contiguous to them, it would not be resorted to by the men. These things were not dreamed of in the days when these barracks were built. After palaces have been built for the reception of convicts and felons, the public mind awoke sluggishly to the necessity of ameliorating the condition of their natural defenders. The ground around all barracks is preoccupied. The vegetable gardens should be established, to be cultivated by married men, and annual prizes should be given for the best vegetables. (*By the Commissariat Officer.*) I think the vegetable gardens could be established here with great advantage, If the full complements of public cattle, with due proportions of servants and dooly-bearers, were always kept up, a portion of their services could be made available for the culture of vegetables. The public cattle could also be used in ploughing and preparing the ground, drawing water, &c. &c., and plenty of manure could always be had from the Karkhanah.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. (*By the Officer commanding Artillery.*) The Artillery soldier's dress consists of jacket, trousers, and cloak, of army blue cloth, shirts, flannel waistcoats, Banyan drawers, socks, a cumbly jacket for stables in cold weather, and the new established Khakee dress. The accoutrements are belt, pouch belt, and sword belt of buck leather. I consider the present dress as suitable in every way to the climate and the soldier's duties, care being taken that the light clothing is used in the hot season by the men on duty, and the woollen clothing in the cold season. The Khakee clothing is useful on hard service. The changes lately introduced into the soldier's clothing are sufficient. In hot weather the men on guard dress in the new Khakee clothing, which is a relief to them. They also wear the new introduced wicker helmet. (*By the Officer commanding 1st King's Dragoon Guards.*) The men of the King's Dragoon Guards have in possession a wicker helmet, cloth tunic, jacket, and overalls, cloak and cape, white drill tunics and trousers, white drill forage cap and helmet covers. The latter are worn on all duties during the day in the hot season. The white clothing is to be replaced by the Khakee clothing as soon as a supply of the latter (ordered some time back) is received from England. The cloth clothing is worn at night and during the cold season. The men have also a sword and carbine and sword belt and pouch belt. The present dress is in every way suitable, except that the cloth tunic might be of lighter material. I would suggest that instead of the present wicker helmet now in use, a light cork or felt helmet, with a plume for the cavalry, as the wicker helmet does not keep its proper shape, and the plume would help to keep off the sun. The present guard dress is cloth clothing during the night, and white or Khakee clothing during the heat of the day. The men are posted near the verandahs, so that in the heat of the day or wet weather, where there are no sentry-boxes, they may walk in them. (*By the Officer commanding 1st Madras Fusiliers.*) The following articles comprise the soldier's kit, viz., a forage cap, a wicker helmet, shell jacket, 1 pair of cloth trousers, 2 pairs of Khakee trousers, 2 Khakee tunics, 4 white shirts, 2 Banyan shirts, 2 flannel waistcoats, 1 helmet cover, 1 blue puggery, 2 pairs of woollen socks, 2 pairs of cotton ditto, 1 pair of braces, 2 towels, 1 hold-all, 1 button stick and brush, 2 hair combs, 1 hair brush, 1 clothes brush, 2 shoe brushes, 1 sponge, 2 pairs of boots (Europe), 1 marking stamp, 1 regimental carpet, 1 blanket, quilt, account book, bible and prayer book, knife, fork and spoon, and stock. I would substitute in lieu of cloth trousers, 2 pairs of flannel drawers. An elderly man, or one of weak constitution, feels the heat and cold when younger and stronger men do not. Cloth trousers are worn and put off by order, to the great inconvenience and discomfort of such men. The flannel under-drawers can be worn and discontinued at the pleasure of the men to suit their own feelings; and worn under linen trousers, they impart as much, if not more, warmth than cloth trousers, and they are easier of carriage and occupy less space in packing. The mania for Khakee clothing is an egregrious mistake. It is not a fast colour, and consequently to preserve uniformity in a regiment is absolutely impossible. The appearance of a regiment dressed in Khakee is variegated, slovenly, and unsoldierlike. A light loose drab serge or flannel tunic will answer all the purposes of Khakee, will look well and uniform, and will last out half-a-dozen linen Khakee coats. The trousers should also be of brown holland, brown nankeen, or any dark-coloured stout linen of a fast colour. The above few alterations would render the kit suitable for every climate in the tropics from Simla to Cape Cormorin. The helmet is the most suitable, as it is the only head-dress fit for a soldier. The present shape is well adapted to the climate, with its 4-inch peak in front, 5-inch peak in rear, and 3-inch side pieces, connecting the front and rear peaks, but the material should be stout felt, of a drab colour, with a soft linen turban of several folds. The wicker or basketwork helmet is most objectionable, and affords little protection from the sun, the basketwork being more or less open, and admitting through the interstices the rays of the sun, the head is totally exposed. It breaks easily; is hard and unyielding and uncomfortable to the head; is pervious to rain and sun, and requires a linen cover. Felt is impervious to both rain and sun; is yielding, soft, and comfortable; requires no cover, and retains its shape and colour. I speak from experience, having worn both, and the felt helmet is immeasurably the superior head-dress. On guard the loose Khakee clothing and basket helmet are worn. The European soldier is generally well protected from sun and rain while on duty.
Duties.	1. (*By Officer commanding Artillery.*) It would be a great advantage to the service in India if recruits before leaving England were instructed at least in the preliminary portion of their drill, so that they might at once, on joining, commence upon the more important drills,—especially in the horse artillery. (*By the Officer commanding 1st King's Dragoon Guards.*) I think it advisable that men should be so far advanced in equitation, sword, and carbine drill at home before being sent to India, that after their arrival two or three weeks' drill would make them fit to take all duties as efficient dragoons. Owing to the heat of the sun, the time for riding drill in this country is very limited; and there is no covered riding school, though it is much required. (*By Officer commanding 1st Madras Fusiliers.*) The health of recruits seldom suffers materially from drill in India when drill is conducted judiciously; that is, when they are not over-drilled, or exposed too long to the sun in the hot season. I think it most advisable that the local European army should have a depôt at home with three provisional battalions,—one belonging to each Presidency, where the troops might be thoroughly drilled before being sent out. 2. (*By Officer commanding Artillery.*) The recruit in the horse artillery commences with his marching and saluting drills until dismissed cavalry foot drills; he has a full hour in the morning, or say from a quarter to 6 to 7 o'clock on six mornings in the week; this lasts generally about five weeks, the men having been partly taught the same in England; the

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VII. Dress, Accoutrements, and Duties—*cont.* Duties—*cont.*	drill is carried on in the evening from 5 to 6 o'clock. When dismissed marching drill the recruit commences his riding drill, and at this he has about 1½ hour actually in the schools, or say from half-past 5 till a quarter to 7 o'clock for five mornings in the week (Thursday being a saddle or kit inspection morning). A smart active man may get through his riding in 6 months, but 7 or 8 months is nearer the average time. While the recruit's mornings are spent in riding drill, he has to go through a course of gun and guard and sentry drills in the evenings, one hour being allotted to each drill, generally from about 4 to 6 o'clock. A man may with ordinary attention be fit for dismissal in each in about two months' time. Sword exercise generally follows. The new cavalry exercise is so simple, that it may be learned in a month, but the recruit's hand and arm cannot be moderately broken in to use the sword in less than 6 weeks; besides these drills there are carbine, pistol, and stripped saddle drill from 10 to 11 a.m. in the verandahs of the barracks, or under trees; pistol drill may be got through in a week; but a man will take a month to learn carbine drill, or to be able to put a saddle together properly, and learn to clean it. In addition to the above there is repository exercise for all artillery men, to teach them the various parts of a gun, &c., use of tangent, a scale, method of cutting furzes, elevating guns, mortars, &c.; and heavy ordnance and mortar drills is also part of the necessary instruction. This is generally the last taught, and it is practised in the evenings. A horse artilleryman cannot be said to learn all his drills, harnessing and driving a pair of horses included, in less than 12 months at the soonest; and even then, supposing him to be a man of a fine healthy constitution. Once dismissed his guard and sentry drill, the practice of the horse artillery, on account of the small number of men in the troop, is to put the recruit on duty with the rest of the men as far as regimental guard duty. The routine of duty with the older soldiers is guard once in four or five days; mounted drills or parades about three mornings in the week, home by 7 o'clock in the cold weather, or half-past 6 at a hot station in the hot weather. On returning from morning drills, &c. the men are allowed 10 minutes, when the trumpet sounds the turn out for stables, and one full hour is spent in grooming; after this the horses are watered. It is usual in a hot season to water the horses at 2 p.m. by the horse-keepers, and not to turn out the Europeans. In the evening an hour is spent by all ranks in the stables, except on Saturday and Sunday. The best periods for drills are from 5 to 7 in the morning for mounted duties, and from 5 to 6 in the evening for foot drills. The average number of nights the men have in bed during the week is according to the number of men for duty, which is sometimes heavy from troops of horse artillery being so short-handed. I have known it one night in two for some portion of the troop. (*By the Officer commanding 1st King's Dragoon Guards.*) The routine of a soldier's duties is as follows:—At gun-fire in the morning the men rise, and at 6 o'clock turn out for field-day or exercise for 1½ hour; stables till 8, breakfast at 8.30. The remaining part of the morning is spent in cleaning up saddlery, accoutrements, &c. under cover. Dinner at 1 o'clock, dismounted drill at 4 o'clock p.m. for half an hour, and evening lines from 5 to 6 employed in grooming horses. The men appear healthy, and do not seem to suffer in any way in health from the above, but the horses are not so well groomed as they ought to be. There are no covered stables, though they have been frequently applied for, and the stable duties in the hot season are much curtailed for fear of exposing the men to the sun. In the wet season it often happens that the horses for several evenings consecutively are not cleaned at all, owing to the heavy rain; and the men are frequently caught in heavy showers, and there being no shelter are completely wet before they can reach their barracks. At this station the best hours for drills, parades, and marches is from daybreak to 8 a.m. and from 4 p.m. to sunset. There are no general orders on these subjects except that guards do not turn out after 7 p.m. The men are on duty on an average every fifth night, or, in other words, four nights in bed during the week. (*By the Officer commanding 1st Madras Fusiliers.*) The usual routine of a soldier's duties is guard duty once every three or four days, the tour lasting for 24 hours. There are usually from three to five drills or field-days per week, lasting for one hour, generally from half-past 5 to half-past 6 a.m. Recruits are also out at drill or exercise every evening from 5 to 6 p.m. So far from suffering in health from such drills, the men benefit to a great degree by the early rising and the necessity of keeping sober. Being unsteady from the effects of liquor whilst under arms is a serious offence. In a tropical climate the best hours for drills and exercises are unquestionably from 5 to 7 o'clock in the morning, and for marching from 2 to 7 o'clock a.m. Medical men may theorise as much as they please, but practical men will universally adopt these hours. If the men have not three nights in bed, the commanding officer would bring the circumstance to the notice of a higher authority, and the duty would be lessened until the object is attained. The rule and the average is three nights in bed for one on duty. Strictly speaking, there is no duty excepting what is made such in any of our cantonments with a view to accustom the troops to such duties as they might be called upon to perform on actual service. Were all the public offices concentrated within a field-work, as they should be, nine-tenths of the guards might be struck off without inconvenience; but I consider that putting men on guard duty every four or six days is necessary, simply for exercise, but such duties are apt to be considered essential to the safety of the place; and when troops are required for purposes for which troops are maintained by the State—for actual warfare—the severity of the self-imposed duties is supposed to be such that the troops are not spared for their appropriate callings. 3. (*By Officer commanding Artillery.*) The quarter-guard at Bangalore is very close to the barracks. Guards are changed daily at half-past 9 a.m. after the mounted drills are over. There are roll-calls at 1 o'clock, 6 o'clock p.m. on holidays, and 8 p.m. If men are behaving disorderly, check roll-calls are sometimes ordered, but this is very seldom. There is apparently no bad effect upon the men from night guards, and every precaution is taken for the comfort of the men on guard. (*By the Officer commanding 1st King's Dragoon Guards.*) The whole of the guards of this regiment are mounted in the vicinity of the barracks, and their duration is 24 hours each. There are three roll-calls by day and two by night. The men do not appear to suffer in their health from night duty, except during the wet season, when colds and rheumatism prevail. I would recommend a waterproof cape with a hood for men performing that duty during the wet season. (*By Officer commanding 1st Madras Fusiliers.*) The guard mounting takes place within barracks squares or on the contiguous parade ground. The tour of duty lasts for 24 hours; there are usually a morning roll-call at 6 or 7 o'clock, when there is no parade or drill, a breakfast

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VII. Dress, Accoutrements, and Duties—*cont.* Duties—*cont.*	and dinner roll-call, and the 8 o'clock roll-call, exclusive of check or punishment roll-calls, which are seldom resorted to. Night duties are not injurious to health in a tropical climate; they are far healthier than day duties. Guard-rooms should be lofty buildings, thickly roofed and freely ventilated, with roomy verandahs; no injury to health need be apprehended in such rooms. It is not the night duties, but the being crowded in small guard-rooms, hot, unwholesome, stifling, during some portions, and being suddenly exposed to night air during other portions of the night, which is injurious to health. The thermometer in a decent guard-room, when closed, should stand within a degree or two of the range obtaining in the open verandah. Night duties would not then be injurious to health.
VIII. Instruction and Recreation.	1. The means of instruction and recreation at this station are as follows:—
	(*By the Officer commanding Artillery.*) There are no ball courts for the Artillery, but there is a skittle ground and a writing school for the men under the schoolmaster. There is also a good library for the troop at head-quarters; no day rooms or soldiers' clubs exist, neither are there soldiers' gardens, workshops, or gymnasia. In the lines there is no theatre, but there is one in the cantonment. More good and wholesome amusement might be found for the men. There is no restriction placed upon the men as to going out in the sun, and no bad effects arise from it. I find that the men do not expose themselves so much as they did formerly, yet I do not think they appear the healthier for it; the men were more hardy formerly.
	(*By the Officer commanding 1st King's Dragoon Guards.*) The men have one good ball court and a skittle ground. There is a regimental school with a serjeant as acting schoolmaster, a cantonment library, and a reading-room in the barracks sufficiently lighted. There is also a room where tea, coffee, and ginger beer are sold and newspapers provided, but there are no workshops, gardens, or gymnasia. There is, however, a theatre, which has an amateur company, and is well supported by soldiers and inhabitants of the cantonment. The skittle ground is under cover, and is used both during the heat of the day and wet weather, and the reading room is also open at all hours during the day. The men are not allowed out of barracks during the day without cap covers, which is found to be beneficial to the health.
	(*By the Officer commanding 1st Madras Fusiliers.*) Within the barracks square occupied by the Madras Fusiliers there is a ball court and a skittle shed, but there is little inducement to frequent either, as there is no shelter for lookers on, and the ball court becomes a furnace from 9 a.m. to 4 p.m., the time when the men have leisure to play. Were the ball court and skittle alley located in a tope of trees affording shelter from the intense glare of the sun, they would be frequented, but they are surrounded by barracks, high walls, and a gravel barrack square, the reflected glare of the sun from which objects is overpowering, and sufficient to destroy the eyesight. Day rooms, soldiers' clubs, workshops, theatres, gymnasia, and gardens are things unheard of, but the arid gravel square, surrounded by high buildings, multiplying the reflections of the sun and concentrating its rays to intensify the heat of a tropical climate, is the sole prospect afforded to the unfortunate inmates condemned to pass the greater portion of every day in listless inaction, watching the lambent sunbeams dancing and dazzling in the fiery atmosphere, until the brain reels under the torturing fascination. Immediately the noonday gun announces that the canteen is open, a rush is made for the raw spirit dram to steep the senses in oblivion, and to forget the tormenting monotony of a vacant existence. The regimental library has no attractions for men who read with difficulty. The canteen and the cot divide the hours unoccupied by the daily routine of petty duties; alcohol and the unrefreshing day sleep each contributing to engender disease and accelerate mental and physical decay. As regards confinement to barracks, the monotony of a private soldier's life is sufficiently painful without aggravating it by a sense of imprisonment. Restriction to barracks under these circumstances is seldom resorted to except as a punishment, and the health of the troops has not suffered from the liberty allowed them.
	2. (*By the Officer commanding Artillery.*) To improve the efficiency of the existing means of recreation and employment, I would suggest the addition of a ball and cricket ground.
	(*By the Officer commanding 1st King's Dragoon Guards.*) I would suggest that a covered gymnasium be erected, and also that a swimming bath be provided for the use of the men.
	(*By the Officer commanding 1st Madras Fusiliers.*) Soldiers require an extensive playground attached to their barracks, such as I have previously described. The canteen would then be deserted, and health, efficiency, and discipline would be promoted to a degree that, in a pecuniary point of view, would prove most advantageous, and would reimburse to Government tenfold the outlay required to furnish the recreation ground with all the necessary appliances.
	3. (*By the Officer commanding Artillery.*) Savings' banks for soldiers are in vogue, and are most beneficial to the men, inducing many to put by their pay; but I find whenever they are ordered on service, they generally draw out the whole of their pay and spend it.
	(*By the Officer commanding 1st King's Dragoon Guards.*) Savings' banks have been instituted for some years, and are found to be beneficial.
	(*By the Officer commanding 1st Madras Fusiliers.*) The best thing a soldier can do with his pay is to spend it freely on material comforts and full feeding. A poor soldier is worth half a dozen rich soldiers. The State must provide for the soldier's after-life and old age; he has nothing to do with the future; present efficiency, health, comfort, and enjoyment should be the object and aim and limit of his views. I would discourage all hoarding, which is a misapplication of the means granted to him by the State to keep himself efficient and fit for work.
	4. (*By the Officer commanding Artillery.*) Good verandahs are attached to the barracks and other buildings to enable the men to take exercise during the heat of the day, and there are very fine trees in the lines.
	(*By the Officer commanding 1st King's Dragoon Guards.*) There is a verandah on each side of every block of buildings occupied by the men, where they take their exercise without injury during all weathers.
	(*By the Officer commanding 1st Madras Fusiliers.*) The barracks of the Fusiliers occupy three sides of a square, with narrow verandahs on the inner side. One-half of these verandahs are

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	exposed to the sun during the early part of the day, and the opposite verandahs during the remainder of the day. No verandahs shade the outer sides of the barracks; the blank wooden shutter must be closed on one side or the other to keep out the sun. Nothing can be conceived more comfortless. Not a tree is allowed within the square to mitigate the heat and glare of a sun doubly insupportable from the reflection of its rays thrown off the hard ground of the gravel square. Trees 20 feet apart would interfere with no purpose for which the square is now used. There is no place where the men can take exercise unexposed to the sun. The skittle alley would afford shelter to a few.
IX. Military Prisons.	(*By the Officer commanding Artillery.*) The floor of the guard-room being of stone, it is desirable that there should be in each a raised platform covered with boards for the prisoner to sleep upon, the cold arising from the stones being prejudicial to their health. Well fastened doors are also required at the entrance to the privies to prevent the terribly offensive smell which arises from them and renders the place of confinement intolerable at times. In the Foot Artillery barracks the floors of guard-room and cells are altogether too low, and consequently very damp in the wet season. In these likewise boarded platforms for sleeping upon are urgently needed. (*By the Officer commanding 1st King's Dragoon Guards.*) As the general rule nearly all the cells in the station are bad. They are too hot, badly ventilated, and much too small for a tropical climate. They might be improved in some particulars by a higher roof with a ridge ventilator and a verandah all round. (*By the Officer commanding 1st Madras Fusiliers.*) The interior of a solitary cell in India is very dismal, being about nine feet square, badly ventilated, and badly lighted. In it the solitary system of imprisonment is carried out to perfection. Long confinement in such a place without exercise must produce a prejudicial effect on the prisoner, physically and mentally. In my opinion the treadmill would be an important and valuable substitute for the solitary cell and long periods of imprisonment.
X. Field Service.	1. (*By Officer commanding 1st King's Dragoon Guards.*) The following circular to officers commanding regiments in H.M.'s service gives the local regulations :— "Head Quarters, Madras, April 30th, 1857. "Sir,—In consequence of the great loss of life from cholera in the wing of H.M. 43rd Regiment Light Infantry, the following local regulations for field medical service have been drawn up for the guidance of officers in command of regiments. "1st. To prevent undue exposure to the sun the hours of marching should, in the first place, be fixed so as to bring the corps to its new encamping ground by an hour after sunrise, the pace not exceeding 2½ miles an hour, including stoppages. In the hills and in feverish jungles it is safer to march by daylight. "2nd. Except when leaving the old and nearing the new encamping ground, the men should march with files well loosened; but every man should retain his place in sections or fours. "3rd. To prevent falling out there should be a halt (for five minutes), half an hour after starting and the same every hour afterwards. On these occasions good drinking water should be supplied by puckallies marching with the advanced and rear guards. It will further this object if the quartermaster in passing leaves a supply of water a mile or two from the new encamping ground. Nothing can be more dangerous than drinking the water usually found by the road side. "4th. Any man who from sickness or fatigue seems unable to march should receive a ticket permitting him to fall out. A non-commissioned officer should be left with him to bring him before the medical officer of the rear, who will decide whether and how he is to be carried. Tickets so issued to be collected at the end of the march and sent to the orderly room. "5th. Before marching off the men should have it in their power to obtain half a pint of coffee and a bit of bread or biscuit, and a similar refreshment may be provided for them when half the march is completed. "6th. As nothing is so apt to induce disease as intemperance, the utmost vigilance is required to prevent the sale of arrack, toddy, or other intoxicating beverages. The regimental cutwal or peon should go with the advanced guard to remove from the road side all natives vending suspicious drinks, and to watch all arrack shops whilst the corps is passing. "7th. Between the hours of 8 a.m. and 4 p.m. soldiers should not be permitted to leave camp; they should be strictly prohibited from entering any village, and natives should not be permitted to idle about camp. "8th. Bathing. No good opportunity for ablution should be missed, but an officer per company and a medical officer should be present at all bathing parades. Though all men ought to be marched to the water, it should be left optional with each to bathe or wash as he pleases. "9th. The encamping ground should not be near any village. The camp should front towards the open country, and men should be prohibited from passing in rear of it. Before the camp equipage cattle are unloaded, the senior medical officer should minutely inspect the ground, and satisfy himself that the place is healthy and the water good, and for this purpose he should precede the column after their first halt. "10th. If there is more than one well or tank, the best water should be selected and reserved for drinking. Should the water be bad, vegetable and gaseous impurities—by far the most dangerous—may be rendered innocuous by boiling, as all that is necessary is to heat it to boiling temperature, and a sufficiency for drinking purposes may be thus prepared immediately after breakfast. "11th. Forced marches. Should it be deemed necessary to shift the camp, the move should be as short as possible, as a night march is always fatiguing, and pitching camp in the dark is attended with many disadvantages. "12th. Halts. It is not generally expedient to halt more than once a week (Sunday). It is better to divide a long march into two than to halt on a week-day, as it is very difficult to keep men out of mischief when they are both fresh and idle.

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References to Subjects and Queries.	REPLIES.
X. Field Service—*cont.*	"13th. The use of sour milk from brass vessels and eating unripe fruits is very hazardous, and the utmost care should be taken that no tainted food is admitted into the camp. "14th. To have a good night's sleep—than which there is nothing more important to health—tattoo should sound shortly after dark. Lights should be extinguished, loud talking and noises stopped by 7.30 p.m.; and no tent peg or baggage allowed to be removed before reveille." 2, 3, 4. (*By the Officer commanding 1st King's Dragoon Guards.*) I have not been on field service or marched in this presidency, and I cannot give an opinion as to the working of all the regulations in questions 2, 3, and 4. (*By Officer commanding 1st Madras Fusiliers.*) During a march or in the field, when any doubt exists as to the healthiness of the encamping ground, the opinion of the surgeon is accepted. On field service the encamping ground is selected by the Quartermaster-General's department, and a sanitary officer (medical) is appointed to carry out the sanitary regulations in force for the preservation of the health of the troops in camp. Water is supplied to field hospitals and to the troops generally by puckallies and bheasties. Tents for hospitals and the troops are so constructed as to admit of ventilation being readily regulated according to circumstances. Those for field hospitals are supplied in proportion to the number of troops. The sick are carried in doolies and in carts, but ambulances are about to be introduced for that purpose. Hospital supplies are provided by the Commissariat department; and in the field, supplies of medicine are obtained from the medical storekeeper in camp, and they are transported in carts and on bullocks. Regiments are provided with field medicine chests.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.
XII. HOSPITALS.	1, 2. (*By the Deputy Inspector General of Hospitals.*) The subject of the hospital and questions connected therewith have been already fully answered by the executive medical officers in their reports on hospitals, particularly by the surgeons in medical charge of Madras Artillery, Her Majesty's 1st Dragoon Guards, and the 1st Madras Fusiliers, at Bangalore. (*The Officer commanding Artillery.*) The position of the Horse Artillery hospital is good; it is between the barracks and the sick lines. The distance from the front to the horse lines is 433 feet, to barracks 156 feet, and from the rear to the sick stables 137 feet. It is about 100 yards from the bazaar. The site is open, freely ventilated, and healthy. The Foot Artillery hospital is in a good position, and is 172 feet from barracks, 516 feet from stables, and half a mile from the bazaar. A few officers' houses are near it. The site is freely ventilated, open and high, with nothing to interfere with the ventilation. It is generally healthy as to elevation, drainage, &c., the burying ground, which is about 600 yards distant, being the only thing that is likely to cause sickness. (*By the Officer commanding 1st King's Dragoon Guards.*) The hospital is situated to the westward of the barracks, a main road running north and south separating them from the hospital enclosure. The barrack latrines in the barrack square are 90 feet distant from the hospital enclosure, and 150 feet from the female ward. The sick horse lines are the nearest stable, being only 150 feet distant, and the riding school grounds adjoin the hospital. The riding ground, together with one private residence, separates it from the large Ulsoor tank, which lies immediately to the north, at the foot of the sloping ground on which the hospital stands. The stabling of a private residence adjoins the building on the east, 113 feet distant from the nearest ward. One of the main roads running east and west is 60 feet from the principal ward, and separates it from a private residence to the south. There is a bazaar to the eastward, and another to the westward, about half a mile distant. The site of the hospital is not open and free to ventilation, unless to the north, where it is too much so. The buildings being on sloping ground, northerly winds blowing over the surface of the Ulsoor tank in this direction wafts damp cold air into the wards, which cannot be kept out, as the doors and the windows on the ground floor are all jalousies, without glass or panels. The guard-house, serjeants' quarters, and the high hospital wall are only 34 feet from the principal ward, and prevent circulation of air from the south, as they are on higher ground than the hospital. On the west ventilation is very bad and impure, as the wind coming in this direction blows over and through the barrack latrines and sick horse stables; and at times the smell has been so offensive that I have been obliged to shift the patients out of the nearest hospital ward. And on the east the closeness of private residences and stables impedes ventilation. The following is an extract from one of my reports:—In the hot weather the prevailing winds are westerly; and not many yards to westward of the hospital the barrack latrines are situated. At times the smell is so disagreeable from this cause that "patients are obliged to be shifted to the opposite side." Since then the new female hospital is building half way between the latrines and the ward found so offensive, and no doubt the female hospital will be unbearable when a westerly wind is blowing. It is decidedly not a healthy site for a hospital, and the building is decidedly not a healthy one, nor ever will be, for the following reasons:—1st. The northerly wind blowing over the Ulsoor tank so close wafts damp air into the wards; 2nd. A main drain, into which all the drains from the whole of the barrack urinals are led, is only about 100 feet from the hospital compound; 3rd. The riding ground is too close; 4th. The neighbouring houses being on higher ground are too close, and the hospital is confined; and 5th. The closeness of the barrack latrines and sick horse stables, independent of the hospital buildings themselves. (*By the Officer commanding 1st Madras Fusiliers.*) The hospital is situated in the middle of the centre square of the three inclosures into which the barrack buildings are divided; in front of the barracks is the parade ground, to the right, divided by a road; officers' compounds in the rear, and to the left the bazaar similarly divided from the cavalry barracks. The building is immediately surrounded by a wall 10 feet high, and beyond that is the barrack

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	buildings, which seriously interfere with the ventilation; the site is otherwise healthy; no malaria proceeds from marshes in the near neighbourhood of the bazaar. This latter, which, however, like all Indian bazaars, is filthy, causes intolerable stenches, and is no doubt prejudicial to health. 3. (*By Officer commanding Artillery.*) The supply of water to the Horse Artillery hospital is abundant from the Ulsoor tank, which is distant about a quarter of a mile. This tank is just now not very clean, but a scheme for cleansing it is now on foot, so as to have a supply of pure wholesome water; there is also a good supply of water from the wells. The Foot Artillery hospital is supplied with water from a tank 800 yards distant. Very good water is also obtained from a large well. (*By Officer commanding 1st King's Dragoon Guards.*) The supply of water for the hospital is brought in puckallies from large wells close to the Ulsoor tank. This water cannot be the purest, as the water from the wells is filtered from the tank which receives the whole of the drainage of a very large bazaar, and of more than half the cantonment, including infantry and cavalry barracks. It can only be improved by running a large drain along the southern margin of the tank to receive the general sewage, and conveying it below the tank, as recommended in my annual reports. Hundreds of bullock loads of impure matter deposited in this tank are removed year after year when the tank is low, and the smell from it is most offensive. (*By the Officer commanding 1st Madras Fusiliers.*) There is no good water in the neighbourhood available. All water used for the hospital is brought from wells at three quarters of a mile distance, or from the Ulsoor tank. 4. (*By Officer commanding Artillery.*) An open drain or ditch carries off the surplus water from the Horse Artillery hospital into the Ulsoor tank, distant about a quarter of a mile. The surface water from the Foot Artillery hospital is carried by an open drain to some low ground at a distance of 340 feet. (*By the Officer commanding 1st King's Dragoon Guards.*) There are no drains to carry the refuse water and other impurities from the hospital. (*By Officer commanding 1st Madras Fusiliers.*) There are no means of drainage except at the cook-room, the refuse water of which is carried by a drain in rear of barrack walls. 5. (*By Officer commanding Artillery.*) The male ward foundation of the Horse Artillery hospital is level with the ground; the female ward is raised 16 inches; there is not free perflation underneath the floors. The wards of the Foot Artillery are raised 2 feet 5 inches, but there is no perflation of air underneath. Most of the roof water from the Horse Artillery hospital sinks into the subsoil; the surplus is carried by a drain into the Ulsoor tank, now the great outlet for all drains, and in consequence very filthy, but is soon to be cleansed, and other outlets for the sewage of the station to be made. No guttering, ground slopes, drainage is sufficient. The roof water from the Foot Artillery hospital runs into an open drain; drainage sufficient. (*By Officer commanding 1st King's Dragoon Guards.*) None of the hospital buildings are much raised above the level of the ground outside, and the door frames at the bottom have sometimes failed to keep out the rain and water. A few feet to the south of the building the ground is higher than the floors from the sloping nature of the ground. Lightly the centre floors of the hospital were raised about 18 inches above the floors of the verandahs, and a step or two lead from all parts of the verandah to the ward. The floor of the hospital is supposed to be solid; what the perflation of air underneath the floor is can be judged from the following extract from a letter addressed by me to the commanding officer of the regiment on the 27th January 1858:—"One of the flags in one of the wards having sunk, and the wards smelling disagreeably, I had it removed to ascertain the cause, and the smell from the opening was so offensive that the apothecary and myself were obliged to run away from it quickly." There is no provision for carrying away the roof water, it sinks into the subsoil. The surface is sloping to the north; there are no drains to convey away the surface water. (*By the Officer commanding 1st Madras Fusiliers.*) The floors of the wards are raised 18 inches from the ground; there is no perflation beneath them; they are solid structures of stone and chunam. The roof water sinks into the subsoil. There is no drainage, the rain water either sinks into the ground or sweeps through the hot little square, then through the barracks square into the drain outside. (*By the Officer commanding Horse Artillery.*) The hospital is constructed of brick and chunam; the roof and walls are single, but sufficiently thick to keep the building cool. The walls are much too low and the accommodation insufficient; in fact this hospital has over and over again been condemned by the inspecting officers. The male ward has a verandah 12 feet broad on both sides; the female ward has a verandah all round 14 feet wide. Both verandahs are broad enough, but deficient in height, and they are very often used for the accommodation of the sick. The Foot Artillery hospital is built of brick and chunam, with single walls and roof, but sufficiently thick to keep the building cool. The ventilation is middling. There is a verandah front and rear 37 feet long, 11 feet 6 inches broad, and 9 feet high, but they are never used for the accommodation of sick or others. (*By Officer commanding 1st King's Dragoon Guards.*) The hospital is built of brick and (I believe) mud, unless round the doors and windows. The walls and roof are single, but sufficiently thick, except the roof of the verandahs which are plastered and low, being only from 12 to 8 or 9 feet high, and the place is very hot inside. There is only one verandah to the hospital 12 feet wide on all sides, communicating by steps with the wards, and shut up with jalousies in the shape of doors and windows. Being enclosed, it affords shelter from the sun's rays; the verandahs are occasionally used to accommodate the sick, as the hospital accommodation is so small. (*By Officer commanding 1st Madras Fusiliers.*) The roofs and walls of the hospital are single, but the former are not sufficiently thick; there are verandahs all round, with purdahs 7 feet 9 inches, sufficient to afford shelter from the sun; they are never used for the accommodation of sick or others. All the hospitals consist of one story only.

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TABLE OF HORSE ARTILLERY HOSPITAL.

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patients' Bed above the Floor.	Windows.* Number.	Height.	Width.
		Ft.	Ft. in.	Ft. in.			Ft.	Ft. in.		Ft. in.	Ft. in.
1 Ward	—	62	20 9	11 4	14,580	193?	6	6 × 3	0 18	10	6 0	3 2
1 Ward	—	12	20 9	11 4	4,012	—	—	—	—	1 swing	2 0	2 2
										1 do.	2 0	3 8
1 Ward, store	—	12	20 9	11 4	—	—	—	—	—	2 swing	6 0	5 0
1 Ward, verandah round	—	12	20 9	7 10	2,669	—	—	—	—	2 bottom Venetian	6 0	5 0
										1 do.	6 0	5 0
1 Ward, verandah front	—	26	12 0	7 10	2,444	—	—	—	—	1 swing	2 0	3 8
1 Ward, verandah surgery.	—	21	12 0	7 10	—	—	—	—	—	1	5 0	3 0
1 Verandah, enclosed front.	—	26	12 0	7 10	—	—	—	—	—	5	6 0	5 0
1 Verandah, enclosed rear.	—	53	12 0	7 10	—	—	—	—	—	10 bottom Venetian.	6 0	5 0
1 Verandah store-room	—	21	12 0	7 10	—	—	—	—	—	1	6 0	5 0
1 Verandah bathing room.	—	26	7 0	7 10	—	—	—	—	—	2 swing	3 6	1 3
Ward, females	—	30	20 0	22 2	13,300	—	—	—	—	—	—	—
Verandah all round	—	—	12 0	15 10	—	—	—	—	—	12 bottom Venetian.	8 0	4 0

* In addition to the jalousies, enclosing the verandahs nearly all round.

FOOT ARTILLERY HOSPITAL.

Total number of wards, 1.
Total regulation number of beds, 13.

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.* Number.	Height.	Width.
		Ft. in.	Ft. in.	Ft. in.			Ft.in.	In.		Ft.	F.
1 Ward	13	54 4	18 0	13 6	13,203	341?	6 6 × 3 6	18	6	5	2
4 Verandah rooms, each for Store, &c.	—	8 4	10 0	8 0	606·8	—	—	—	2 swing ventilators.	4	3
Front and rear open verandahs, each.	—	37 4	11 6	9 0	3,882	—	—	—	4 „	5	2

* In addition to the jalousies, enclosing the verandahs nearly all round.

FIRST KINGS' DRAGOON GUARDS HOSPITAL.

Date of construction, about 54 years ago.
Total number of wards, 5.
Total regulation number of beds, 77, but only capable of holding 52 or 54.

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.* Number.	Height.	Width.
		Ft.	Ft.	Ft. in.			Ft.	In.		Ft.	Ft.
No. 1 Ward	28	101	18	15 6	28,179	1,006	64	18	20	1 3	3
No. 2 Ward	12	61	18	15 6	17,019	1,418	91	18	16	1 3	3
									2	4 6	3
No. 3 Ward	9	34	18	15 6	9,486	1,054	68	18	8	1 3	3
No. 4 Ward	5	25	18	15 6	6,975	1,395	90	18	8	1 3	3
									2	4 6	3
No. 5 Ward	23	80	18	16 0	23,040	1,001	62	18	20	1 3	3

* In addition to the jalousies, enclosing the verandahs nearly all round.

FIRST MADRAS FUSILIERS HOSPITAL.

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Height of Bed above Floor.	Windows. Number.	Height.	Width.
				Ft. in.		In.		Ft. in.	Ft.
No. 1 Ward	26½	106	18	Top of walls 10 9	26,712	18	16	5 8	4
No 2 Ward	12½	50	18	Thence to roof 6 6	12,600	18	6	5 8	4
No. 3 Ward	4¾	19	18	Ditto. 6 6	4,788	18	4	5 8	4
No. 4 Ward	4¾	19	18	Ditto. 6 6	4,788	18	4	5 8	4
No. 5 Ward	12½	50	18	Ditto. 6 6	12,600	18	6	5 8	4
No. 6 Ward	26½	106	18	Ditto. 6 6	26,712	18	16	5 8	4

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	(*By the Officer commanding Artillery.*) The hospitals of the Horse Artillery and Foot Artillery are so placed as to receive the full benefit of the prevailing winds. The windows of the fomer hospital open inside, and their construction is as good as the building will allow. The arrangement and construction of the windows of the latter hospital are also conducive to ventilation and coolness. (*By the Officer commanding* 1*st King's Dragoon Guards.*) The hospital cannot receive the full benefit of the southerly or easterly wind. The whole verandahs are enclosed with jalousies, which act the part of doors and windows; and the wards are so cold that I have been obliged to get coarse canvas curtains to hang up to the openings between the verandahs and wards to keep out the cold damp night air. The roof of the wards has lately been raised 3 or 4 feet, and swing glass windows have been put in the walls high up. The construction of doors and windows is not conducive to ventilation, as the cold night airs cannot be kept out. (*By Officer commanding* 1*st Madras Fusiliers.*) The hospital is not placed so as to receive the full benefit of prevailing winds. Only a very strong breeze can reach the hospital, shut in as it is by other buildings. The windows and doors are so placed that when a strong breeze blows, unless the windward side is closed, the wards are swept by draughts of air. 6. (*By Officer commanding Artillery.*) The ventilation of the wards of the Horse Artillery hospital is as good as such a building will allow of. When wind and rain come the doors and windows must be closed, which makes the wards close. The ventilation in the Foot Artillery hospitals keep the wards at all times free of odour or closeness. The Horse Artillery hospital has venetians, but there are no jalousies or jhilmils to the Foot Artillery. (*By the Officer commanding* 1*st King's Dragoon Guards.*) In addition to the jalousies and windows mentioned, ridge ventilation along the top of the wards has lately been added. The means of ventilation are sufficient to keep the wards free of odour or closeness, unless when the odour comes from outside. The jalousies are boards six inches wide, sloping over each other when shut; by means of a pivot at each end, and a connecting piece of wood, they are all raised up to a right angle, and admit the air freely. When shut they do not close sufficiently to keep out the wind, a space of about an inch being left unclosed between each board. (*By the Officer commanding* 1*st Madras Fusiliers.*) Ventilation is effected by means of doors and windows below, and openings in the roof above. By keeping all open the ventilation is sufficient, but for the reasons before given this is not always practicable. There are no venetians, but in the verandahs there are blinds of split bamboo and blue cloth. 7, 8. (*By the Officer commanding Artillery.*) There are no means for cooling the air in any of the hospitals, nor any apparatus for warming the wards. The floors of the Horse Artillery hospital and the Foot Artillery hospital are whitewashed once a week. (*By the Officer commanding* 1*st King's Dragoon Guards.*) There are no means of cooling the air and none of warming, unless the canvas curtains mentioned, put up for the openings between the verandahs and wards to keep out the cold wind, be considered such. The walls of all the hospitals are whitewashed every year, but oftener if required. The officer commanding the 1st Dragoon Guards believes that the ceilings of the ward of his hospital are seldom or never whitewashed. 9. (*By Officer commanding Artillery.*) The privies are very small; there are no urinals. The filth is conveyed away in night-carts. There is no drainage, but water is abundantly supplied. No cesspools exist, and the privies are rather offensive. In the Foot Artillery the drainage of the privies is good. There is a plentiful supply of water. The cesspools are some distance in the rear, and are not offensive. (*By the Officer commanding* 1*st King's Dragoon Guards.*) Tubs are to be used in the privies, and the contents carted away every morning. The privies are not used as yet. (*By Officer commanding* 1*st Madras Fusiliers.*) The privies are in the rear of the hospital, and the urinal fæces are carried away in tubs. They are not properly drained, but are not more offensive than is unavoidable. 10. (*By Officer commanding Artillery.*) The bath-room is merely a portion of the hospital verandah closed in, but is quite sufficient for the sick in both Artillery hospitals. (*By Officer commanding* 1*st King's Dragoon Guards.*) The lavatories are small rooms 12 feet by 8½ off the passage going to the latrines. These are not sufficient for the hospital, and are much too small; and being so small and badly ventilated, they will more than likely smell very badly when used a short time. (*By Officer commanding* 1*st Madras Fusiliers.*) There is a bath-room in the rear of the hospital sufficient for the purposes of the sick. 11. (*By Officer commanding Artillery.*) In the Horse Artillery and Foot Artillery hospitals large tubs are used for bathing the sick. These are not sufficient in the former building owing to the small size of the bath-room. (*By the Officer commanding* 1*st King's Dragoon Guards.*) Large tubs are proposed to be used for bathing the sick. (*By Officer commanding* 1*st Madras Fusiliers.*) The sick are bathed in tubs, but the supply of water is limited, it having to be brought from a distance by puckallies. 12. The linen of the hospitals of the Horse Artillery, Foot Artillery, and Fusiliers is done by dhobies. (*By Officer commanding* 1*st King's Dragoon Guards.*) The linen is not washed in the hospital. It would be well if there was a washing machine in the hospital, as the linen would be better washed and last longer. It is now done badly, and injured by the men employed from their washing the linen by beating it against stones at the side of the tank. Two native tailors are constantly employed mending the linen from this cause. 13. (*By the Officer commanding Artillery.*) The storage is insufficient, but what there is is dry. (*By the Officer commanding* 1*st King's Dragoon Guards.*) The storage is dry, but not sufficient, as there is only one place 15 feet square. (*By Officer commanding* 1*st Madras Fusiliers.*) The storage is very limited, but dry. 14. (*By Officer commanding Artillery.*) Wooden cots 18 inches in height, 6 feet 6 inches long, and 3 feet broad, are used in hospital. They are taped with broad tape, and are quite sufficient. (*By Officer commanding* 1*st King's Dragoon Guards.*) The hospital bedsteads are wooden, with bands of wide tape in the centre. The bedding is straw; iron bedsteads and air beds are much required. The wooden bedsteads are with difficulty kept clean and free from vermin. (*By Officer commanding* 1*st Madras Fusiliers.*) Wooden bedsteads are used in the hospitals, with tape bottoms.

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	15. (*By Officer commanding Artillery.*) The cook-house of the Horse Artillery hospital is too small and too close to the sick wards. The diet is properly cooked, and can be sufficiently varied. The Foot Artillery hospital is 100 yards from the sick wards. (*By the Officer commanding 1st King's Dragoon Guards.*) The old kitchen has been removed, and the new one is not yet built. The diets are properly cooked, but cannot be sufficiently varied for want of proper kitchen ranges. (*By Officer commanding 1st Madras Fusiliers.*) The kitchen is good and sufficient. 16. Copies of diet tables, &c. are forwarded. They are in strict conformity with the forms and regulations laid down in the medical code. 17. (*By Officer commanding Artillery.*) The provision for attendance at the hospital is as follows:—1 hospital serjeant, 1 European nurse, 5 male coolies, and 2 female coolies, which are ordinarily quite sufficient. When extra coolies are required, they are supplied by the Commissariat; also, under any peculiar circumstances that may render it absolutely necessary, an orderly comrade may be allowed to attend on a sick soldier in hospital under the sanction of a commanding officer. There is no separate establishment for the Foot Artillery. (*By Officer commanding 1st King's Dragoon Guards.*) The following is a list of the hospital subordinates and servants allowed by regulation for the attendance on the sick of the regiment, but it is seldom that the full allowance of hospital subordinates are present with the corps, as they are constantly removed from the regiment for service with other corps and detachments.

Description.	No.	Description.	No.	Description.	No.
2nd Apothecary	1	Cooly maistry	1	Cooks	2
Assistant Apothecary	1	1st class Coolies	8	Washermen	2
2nd Dresser	1	2d do. do.	8	Sweepers	3
Hospital Serjeant	1	Tailors	2	Toties	3
Do. Writer	1	Puckallies	2	Dhooly-bearers	6
European Nurse	1	Conicopoly	1		
Native Nurse	1	Assistant Conicopoly	1		

One assistant apothecary has been taken away from the regiment five times in two years, and the second dresser about eight times; and now the senior apothecary has been removed on one day's notice to go to China with the 44th Regiment. The system does not work well, as may be seen by my letters on the subject; permanent hospital subordinates are much required.

(*By the Officer commanding 1st Madras Fusiliers.*) The hospital attendants are, 1 hospital serjeant, 1 hospital nurse, 3 first-class coolies, and 8 ward coolies, which is sufficient.

18. (*By Officer commanding Artillery.*) The Horse Artillery hospital is too low and has not sufficient accommodation, but otherwise the sanitary condition is good. No epidemic has prevailed since I assumed medical charge, upwards of a year ago, and there has been no hospital gangrene or pyæmia. The Foot Artillery hospital has been abandoned as being unfit.

(*By the Officer commanding 1st King's Dragoon Guards.*) At present one of the barracks is used temporarily while the hospital is undergoing alterations. The alterations in the hospital itself are now finished. I look on the improvements made as of very little use, and I am sure it will be found ultimately that what I said in my annual report for 1858 regarding the improvements then contemplated, but now executed, will turn out to be true, and the money expended has been thrown away. Before the alterations a number of men were attacked with acute rheumatism while in hospital, and it was necessary to invalid nine men with that complaint. For this class of patients and those attacked with dysentery it is now much worse, as it will be found colder in the cold season.

(*By Officer commanding 1st Madras Fusiliers.*) There has been no epidemic disease, hospital gangrene, or pyæmia of late; but I consider that with any great increase of sick or peculiar atmospheric condition, or other predisposing causes, they might reasonably be expected. The amount of accommodation is far too limited, as the total area of the six wards, allowing 1,000 cubic feet for each adult, gives room for only 84 patients; but as there is one ward occupied by the women and another by the nurse, there is only proper accommodation for 67 men. The buildings are also too much shut in, with no means of ventilation except by doors and windows, on opening which the whole ward is swept by draughts.

19. (*By the Officer commanding Artillery.*) The present hospital for the Horse Artillery, I believe, has been condemned as being too low, small, and inconvenient, besides requiring more commodious bath-rooms, privies, store-rooms, and a separate ward for ophthalmic cases, as also one for confining patients suffering from mental aberration. A new hospital is about to be built for both Foot and Horse Artillery.

(*By Officer commanding 1st King's Dragoon Guards.*) I think that the sick soldier requires as good accommodation as the healthy soldier, if not better. The hospital, after undergoing all the improvements it was possible to make, now affords very inferior accommodation, and is not half as good as the men out of hospital have. I do think a new hospital should be erected as recommended by Dr. Mouatt 26 years ago, who in all his annual reports stated, "The wards were so narrow that there was not room for tables for the men to dine off;" by the Deputy Inspector General of Her Majesty's Hospitals; by the Superintending Surgeon of the Division; by Col. De Butts, late Engineer of the station; and by myself, as seen by my annual reports since the regiment has been here, and I believe by all commanding officers of regiments. I would also suggest that the open high ground in front of the barracks is the proper place for a hospital, as recommended by Col. De Butts, and for the same reasons as I have given in my annual reports.

The following are some of the objections to the present hospital, and which now exist after all improvements:—

1. There are no small wards for serious cases or maniacal patients.
2. The wards are so narrow that there is not room for dining tables for the men.
3. There are no covered places where the men can walk about and take exercise, unless the covered way to the latrines.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	4. There are no nurses' quarters, nor quarters for the apothecary, some of whom could not get a place to live in nearer than a mile, and have to go backwards and forwards to the hospital all day long, as their services may be required. 5. There is no way of regulating the temperature of the wards, or keeping out the cold air at night. 6. There are two steps from the wards down to the closed verandah where the close stools are kept. The exertion of going up and down these steps will be likely to be attended with injurious consequences to weakly patients when suffering from dysentery or fever. 7. The whole hospital is much too small for any regiment. The table filled in shows what it is capable of holding:—77 beds, allowing about 1,000 cubic feet of space for each bed; whereas the allowance, according to the regulation, is 1,500 cubic feet per man. Unless the beds are put almost touching, or in the verandahs, it is impossible to put into the wards more than 64 beds; but, according to the Hospital Regulations, page 38, sect. 7, par. 2, allowing 1,500 feet for each man, it is only capable of holding 54 patients. 8. The hospital is scarcely raised above the ground, and will be always damp in wet weather. 9. The buildings are too crowded together, too close to the public roads and the neighbouring houses, which impedes the circulation of air into the wards. I would suggest a new hospital to be built, with inner and outer verandahs, at least as good as the men's barracks. It has been hitherto found that men are reluctant to leave good barrack-rooms when unwell, and come into an inferior building, such as the present hospital is; and when they do come in, they are discontented, and wish to get back to their barrack-room, unless they improve rapidly, which cannot be expected in the present hospital. I have generally been obliged to send men out as convalescents as quickly as possible, as I have found they have come round more quickly in the barrack rooms than in this bad hospital. (*By Officer commanding 1st Madras Fusiliers.*) The occupation of two of the wards as nurses' quarters and female ward, besides being objectionable, as seriously curtailing the accommodation of the men, is also highly improper from the necessary indecency to which it leads, the men being quite visible while sitting at stool, from the women's ward. The only means I can suggest of remedying these defects is by the entire reconstruction of the hospital on a better site and on a different plan. 20. (*By Officer commanding Artillery.*) There are no convalescent wards in the Foot Artillery or Horse Artillery hospitals. Patients recovering from disease are allowed to take exercise morning and evening in an ambulance when considered necessary. There is no suitable fenced-in ground or shaded walks to take exercise in, and there are no seats. (*By Officer commanding 1st Dragoon Guards.*) Two bullock convalescent carts are employed to take out convalescents for a drive mornings and evenings. There are no suitable grounds, walks, trees, or seats set apart for the use of the convalescents. (*By Officer commanding 1st Madras Fusiliers.*) No provision is made for the exercise of convalescents. 21. (*By Officer commanding Artillery.*) The sick wives and children of men are treated in the female ward in the Artillery hospital. The present arrangements are sufficient, and no improvement is necessary. (*By Officer commanding 1st King's Dragoon Guards.*) A female hospital is building, consisting of one ward, 30 feet by 20 feet, with a 12 feet enclosed verandah all round. This verandah is partitioned off to make four small rooms for a female nurse and lying-in patients. It is too small and badly planned for the accommodation of 78 women and 104 children. It should have had an outer verandah all round, and more than one ward. The present arrangements are not satisfactory, and the only improvement to be suggested is a new hospital, and at least as good as the men's barracks. (*By Officer commanding 1st Madras Fusiliers.*) One of the men's wards is used for the women and children, the nurse occupying a small ward. This is an objectionable arrangement in every way. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations. 23. (*By the Officer commanding Artillery.*) The medical officer has no power beyond representing any sanitary defects as far as the buildings, &c. are concerned. As to diet or medical comforts, he orders whatever he considers necessary for the patient in the way of extras. (*By Officer commanding 1st King's Dragoon Guards.*) The medical officers appear to have little or no power in matters appertaining to the sanitary state of the hospital. If I had any power, a better hospital would have been built long ago, as good as the men's barracks. I have always been able to get the hospital repaired, and to make arrangements about the diet. I have not marched in this presidency. (*By Officer commanding 1st Madras Fusiliers.*) Medical officer can recommend repairs and cleansing when necessary, and has entire control over diet and medical comforts within the hospital at stations, camps, and on the march. 24. (*By Officer commanding Artillery.*) There is no convalescent hospital at present; but if a convalescent ward be attached to each hospital, it is all that is necessary. (*By Officer commanding 1st King's Dragoon Guards.*) The hospital is too small to have any part of it for convalescents, as it is only capable of containing 63, or by regulation 54, beds. The authorities imagine it is capable of holding 77 patients, but I am at a loss to know where the bedsteads could be placed, unless in the verandahs. There is no place in or near the station for convalescents. It would be a great advantage to have some place about a mile or two outside the cantonment to send convalescents to. The separate building, commonly called a convalescent ward, is included in calculating the amount of accommodation available for a regiment, and cannot be used for convalescents, as it is required for the sick. Quarters for the medical subordinates are also much required. (*By the Officer commanding 1st Madras Fusiliers.*) There is no convalescent hospital or ward, nor do they appear to be required. (*Remark by the Commander-in-Chief.*) "The present Dragoon hospital is not so well placed as it might be, neither is it a first-class building, but still it is not altogether so objectionable as represented, and even were it so, sanction for a new hospital could not be given by the Government of India in the present state of the public finances." (Signed) P. G.

BANGALORE. MADRAS.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	(*The queries under this head are answered by the Rev. J. Gorton, M.A., Chaplain of St. Mark's.*) 1. The distance of the burial-ground used by British troops is as follows:—From the Foot Artillery barracks, 80 yards; from the Horse Artillery ditto, 800 yards; from the Dragoon ditto, 380 yards; from the old Dragoon ditto, 1,200 yards. The prevailing winds are N.E. and S.W. The N.E. wind blows from the burial-ground over a portion of the cantonment, and the S.W. would blow over the new Dragoon barracks only. 2. The soil is gravel and red clay, the drainage is good, decomposition takes place readily, and the ground is carefully kept. 3. The grave space allowed is 6 feet by 4, and the interval between the graves about 4 feet. They are never reopened. Interment is compulsory at ordinary times within 24 hours, and during epidemics when notified by the surgeon. There are no regulations in force regarding the burial-grounds where the native troops bury or burn their dead. 4. The grave-yard is never offensive. 5. The dead of camp followers and bazaar people are buried or burned in localities beyond the limits of the military cantonment. 6. No injury accrues to the public in this station in military limits from the present practice. 7. There is to be an alteration carried out almost immediately, or a new burial ground for the cantonment generally, and the troops in garrison. The land has been selected and given by the Commissioner of Mysore for this purpose.

(Signed) C. C. Linton, Deputy Inspector-General of Hospitals, M.D.
F. Burgoyne, Lieutenant-Colonel Commanding Artillery in Mysore.
T. Nisbet, Major R.D.G., Commanding 1st King's Dragoon Guards.
T. J. Fischer, Colonel Commanding 1st Madras Fusiliers.
G. D. Beresford, Lieut., Deputy Assistant Quartermaster-General, Mysore Division.
E. E. Miller, Major, Assistant Commissary-General.
J. Gorton, M.A., Chaplain.

Aug. Spencer, Major-General Commanding Bangalore and Mysore Division.

6th February 1861.

SECUNDERABAD.

Accommodation:

European Troops	Artillery	1 Troop H.A.	194
		3 Batteries F.A.	348*
	Cavalry	1 Regiment of Dragoons	600
	Infantry	2 Regiments (Royal Regiment)	900
		2 Regiments (Royal Irish)	936
Native Troops	Cavalry	1 Regiment	391
	Infantry	4 Regiments of	715 each.

Of the above, 1 Troop H.A. and 1 Battery F.A. are located in the barracks of the Infantry Regiment at Trimulgherry, and 1 Regiment of European Infantry in buildings erected for a Native H.A., and a Native Infantry Regiment in temporary barracks and in houses.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is undulating, with bold projecting masses and ridges of granite, syenite, and greenstone. Fragments of these rocks everywhere strew the ground and jut from the soil; they sometimes rise in rocky ridges, bleak and bare, from 40 or 50 to 100 or 150 feet in height, and from partial decomposition and disintegration, leave tor-like masses of the rock poised in fantastic forms, presenting a strange picturesque appearance, often with a castellated outline. This aspect is very little diversified with trees, but in the hollows formed by the undulations, or in the more level grounds, the mango, tamarind, banyan, and palm trees, grow well. Arboreous shelter is much needed, and planting is desirable. The whole country around Secunderabad undulates, and the soil everywhere is composed of the granitic sand derived from the above-named rocks, and the general character of the country is extremely dry. There is very little wood and no jungle for miles around, and there is no collected body of water of any kind, except after a heavy rainy monsoon (a very rare occurrence) when the tanks, which are numerous, and some very extensive, become full. 2. The general elevation of the station above the sea is 1,800 feet. The station is so widely scattered that the elevation of different points varies; most of the barracks occupy the undulating ground, generally at its highest levels (with some exceptions, which will be specially named). The highest point in Secunderabad is about 110 feet above the Moosy river at Hyderabad, 6 miles distant. At the time of writing, after a season of great drought, the tanks are almost entirely dried up. A very fine tank, called *Hoossain Sagur*, impinges on the cantonment on the W. side, and when full, which it has not been for nine years, it inundates the lines of a Native Infantry corps in that direction. The Moosy, a mere water-course, through which the country drains, is 6 miles off. Certain parts of the cantonment are as high and as healthy as any ground adjoining, but there are places in the station, (especially the lines of one Native Infantry corps, those on the Hoossain Sagur tank, and in a much less degree the old European Infantry barracks) which are at a lower level, and have not proved as healthy as other sites. (Remark by H. E. the Commander-in-Chief.—The old European Infantry barracks have proved eminently unhealthy for nearly 30 years past; *vide* my observations on them in my inspection tour, Report of February 1859. (Signed) P.G.) 3. The table land of Bedur is about 70 miles direct from Secunderabad, and is 700 feet above the station.

* Additional barracks completed for two-thirds of a battery, at present accommodated in tents, and not included.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	4 The river Moosy is about 6 miles from Secunderabad, and the artificial lake called *Hoossain Sagur* borders the S.W. side of the station. At the point of the station indicated above the Hoossain Sagur tank is liable to overflow between the months of June and October, and it would remain at the skirts of the station for a short time till subsidence from evaporation and extensive irrigation took place. No overflow ordinarily occurs, and its effect on the station would be limited. The ground is very irregular from the undulations named above. Nothing like ravines are produced, but depressions or hollows are frequent, and there are few water-pits, and none likely to affect health. 5. The station is very open, and free perflation of air everywhere exists. Trees are abundant in the grounds of the officers' lines, but nowhere in excess, and the only part where there is objectionable closeness of houses is the site of the Native Infantry lines, on the Hoossain Sagur tank, to which the great bazaar of Secunderabad is contiguous. The temperature of the station is decidedly raised by reflected sun-heat. The rocky ridges in every direction and the masses of rock jutting almost everywhere from the soil, some in close contiguity to buildings occupied by the troops, absorb and reflect heat, and raise the temperature of their neighbourhood during the night by radiating the caloric which they have acquired during the day. The station is much exposed to cold and variable winds during and after the rainy monsoon, and when the rains have quite passed away. There is an extreme dryness combined with cold, parching yet chilling the surface, and producing internal congestions resulting in hepatic disease, dysentery, diarrhœa, and fevers often of a typhoid type. Hot land winds prevail from March to June, which exhaust and enervate the system; but health is generally better among the troops, though small-pox and cholera then prevail sometimes, and no doubt the exhausting effects of a long continued high temperature on the system, especially on the skin, leave a proneness to the diseases of the succeeding cold and wet season. 6. There is very considerable cultivation in the country surrounding the station, but great tracts are sterile and uncultivable from the rocky nature of the soil. There is an extensive tract irrigated from the Hoossain Sagur tank, which is adjacent to one part of the station, as has been said, but is very remote from the greater portion. There are also patches of land in many places in and about the station irrigated from smaller tanks and wells, but none nearer to any barracks or lines than 200 or 300 yards. Artificial irrigation is certainly not in general observed to have any effect on the health of the station; the only question is concerning a tract which is the line of drainage from the old European Infantry barracks, particular attention to which is being paid; but owing to the land not belonging to the British Government, but to the Nizam, difficulty is found in establishing a conservancy over the tract which it is desirable to be able to do. There is no actual prohibition of rice cultivation, but practically there is no opportunity of carrying on such cultivation in close proximity to any part of the station. The only extensive tract under rice cultivation is the land irrigated from the Hoossain Sagur tank, and no part of this approaches within a mile of any place occupied by troops. Patches of rice cultivation occur in many scattered spots in the low levels about the station, but in no way prejudicial to the public health. No indigo is cultivated nor any preparation of hemp or flax carried on near the station. 7. The large city of Hyderabad is 5 miles from the nearest point of the cantonment, and the bazaars and town of Secunderabad form an integral part of the station, joining on to some of the regimental lines, but very remote from others, and the new buildings for European troops are far away. The relative position will be best learnt by the plan. 8. The geological formation of the district is altogether primitive; granite, syenitic granite, with veins and dykes of basalt and other forms of hornblende rock. The surface soil is composed of the detritus of the above-named rocks, where the rocks themselves are not protruding in a crystalline state and the sub-soil is altogether composed of the rock itself, either crystalline still, or what is more frequent in a soft friable decomposing state. This is more particularly the case with the granite rock in which the felspar is abundant with quartz and no mica. The hollows and depressions, rarely considerable enough to be termed valleys, are of a more alluvial soil, but still principally composed of the rocky detritus. At some miles from the station there are tracts of the regur or black cotton soil. The old parts of the station appear as if they were but sparsely populated before occupation. The place in which the new barracks are is quite new ground. 9. Water is found in the lower levels about 6 feet below the surface, but in the higher grounds, where many of the wells are, water is not reached under 50 feet, and many wells are deeper than that. The depths do not greatly vary in the dry and rainy seasons, but the quantity of water issuing varies very considerably. 10. Owing to the undulating conformation of the ground, and the non-retentive character of the surface and subsoil, as noted above, the rainfall flows readily away, and there are no surface springs near the station. With the two exceptions specified above, all the public buildings are on the higher undulations where no water lodges. The two points of the station alluded to are more or less liable to drainage from higher levels, but the locations of each regiment of the force are so widely apart, and each so distinct in its topography from the others, that it is impossible to give an answer which shall be applicable to all. It may be said generally that, with the exception of the Native Infantry lines, on the Hoossain Sagur tank, and in a less degree the old European barracks at Secunderabad, no place occupied by troops is liable to have the drainage from higher ground pass into its subsoil. 11. The water supply is derived altogether from wells. It is not stored in tanks for the use of the troops, and there are no tanks within the cantonment. The superficial area of the great tank above adverted to varies from a few hundred square feet, which in dry seasons it covers, to several square miles to which in rare seasons it is said to extend. The tanks are rarely full. The smaller neighbouring tanks are often quite dry, but the large one is never quite so. As a general practice no tank is used both for drinking and bathing; but it is possible that when the Hoossain Sagur tank comes up to the borders of the cantonment (which it has not done for nine years) the water may be used for both purposes. When the Hoossain Sagur tank floods the neighbourhood it is said to produce fever on the side on which it extends. The only way of preventing it is by removing the lines of the native corps to another locality, which it is understood will be effected when arrangements now going forward are completed. 12. The water supply being obtained from very numerous wells, the amount cannot be given even approximately; but it is generally very abundant, liable however to run low in the dry season, if the previous rain-fall has been scanty, and after a succession of deficient monsoons

SECUNDERABAD. MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	(as in the present year 1860) water for all purposes is scarce. In colour it is almost always quite clear, but sometimes it is slightly opaque and white from earthy and saline admixture. It is quite inodorous. The following are the results of the analysis of water at Secunderabad:—

		Specific gravity.	Total Solid Matter per Gallon.	Organic Matter per Gallon.	Inorganic Matter per Gallon.	
			Grains.	Grains.	Grains.	
Trimulgherry -	Well, near Hospital - -	1000·26	10·32*	2·64	7·68	The water of these wells and tank was examined microscopically, specially with a view to discover the ova or young of dracunculus, but they were not found.
	Barrack Well -	1000·3	17·68*	3·44	14·24	
Hoossain Sagur -	Tank - -	—	33·6	8·0	25·6	
Native Infantry Lines	1st Well - -	—	38·72	11·28	27·44	
	2d do: - -	—	119·28	—	89·18	
	3d do. - -	—	44·416	—	16·016	

* In each case the inorganic constituents were found to be carbonic acid, lime, chlorine, soda, silicic acid, sulphuric acid, and magnesia. Mere traces of the three last were discoverable.

Samples from the site of the new Trimulgherry barracks have been analysed by the Professor of Chemistry at Madras; also from the Hoossain Sagur tank, and from the wells in the Native Infantry lines in its vicinity, and both pronounced remarkably pure.

Water is raised by the ordinary native method in a skin bag, lowered by a rope running over a pulley, and hauled up by a pair of bullocks moving up and down an inclined plane, and discharged into a reservoir, whence it is led where it may be wanted in conduits of masonry, or it is carried in skins placed on a bullock, which is the usual way of conveying it about. The water supply is liable to run short in seasons of drought, which are frequent here, and (as in the present season 1860) to become insufficient for so large a body of troops, including so many horses and other animals. Engineer officers are of opinion that water might be stored to a large amount in the hollows of the undulating ground by the erection of suitable embankments, which it is very desirable to effect.

(Remark by H. E. the Commander-in-Chief.—See the observations of Col. Arthur Cotton with respect to storing water at Secunderabad in my inspection tour, Report of February 1859. (Signed) P. G.)

13. No remark.

14. Inquiries as to the selection of new stations are submitted for the consideration of a committee composed of officers of the Engineer and Quartermaster-General's Departments, and of medical officers, who inquire into the subjects named, each in his particular line. There seems nothing to suggest on this head.

II. CLIMATE.

1. The instruments available for conducting meteorological observations are a standard barometer; standard thermometer; Fahrenheit's thermometer; self-registering maximum thermometer; do. minimum do.; wet and dry bulb do.; Daniel's hygrometer; Regnault's do.; Lind's wind gauge; rain gauge.

The following table contains 10 years of observations from January 1st, 1850, to December 31st, 1859:—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Dew, Clouds, Winds, Storms, &c.
January -	28·88	73	14	78	64	74·7	62·6	93	·37	N.E.&N.W.	Calm	—	Weather fine and pleasant, a little dew.
February -	·61	76	16	82	66	79·6	63·4	99	·57	N.W.&N.E.	Moderate	—	Clear and pretty cool, little or no dew.
March -	·33	81	14	87	73	83·4	68·7	104	·49	N.E.&N.W.	Moderate	—	Clear and cloudless, rather warm, no dew.
April -	·31	86	15	92	76	88·0	70·2	104	·71	N.W&S.W.	High winds	—	Hot, with high winds, occasional storms of dust.
May -	·82	89	13	95	82	91·4	73·4	113	1·71	W. & S.W.	High winds	—	Very hot, with frequent dust storms and hot winds.
June -	·65	83	9	86	77	86·5	74·4	98	3·32	N.W. & W.	Moderate	—	Cloudy and pretty cool, hot winds cease.
July -	·62	80	8	83	75	83·1	74·3	92	4·84	W. & S.W.	High winds	—	Cloudy and rainy, with high winds.
August -	·56	79	8	83	74	80·6	74·5	92	4·84	W. & N.W.	High winds	—	Very cloudy, with heavy rains and strong winds.
September	·64	78	9	82	73	79·9	76·1	86	3·60	N.W.&S.W.	Moderate	—	Cloudy and rainy, dew.
October -	·78	78	11	82	71	79·4	70·7	92	4·59	N.W.	Moderate	—	Very cloudy, with heavy showers, dew.
November	·56	76	12	79	67	75·0	65·3	91	1·5	N.E.&N.W.	High winds	—	Overcast, with 2 or 3 heavy showers, dew.
December	·70	73	13	77	64	72·8	62·4	82	·8	N.W.	Moderate	—	Overcast, weather pleasant, little or no rain.

3. The climate may be characterized as remarkably dry. The average number of days on which rain falls is 50; the average annual rain fall 28 inches. From January to June the air is very dry, the first two months being very chill, and at the same time parching, with great variableness in temperature, while from March to June hot winds blow, and the heat

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	is excessive. Fogs are infrequent, and dew very rare. Tree planting is much needed in the open, exposed ground of Trimulgherry, lately occupied for building the new barracks. There is no canal or other irrigation near enough to the places occupied by the troops (except what has been already noted) to influence the climate. The air is generally clear and pure, but liable in the hot season to occasional dust storms, but not influencing the atmosphere generally in any unfavourable manner. It is a very changeable climate, and great attention is required to clothing and shelter from the weather to prevent bowel complaints. The diet is particularly attended to, as also shelter and clothing. No drills or exercises are allowed during the hot weather, after the sun has obtained any power. The most healthy months are undoubtedly those of the dry and hot season, March to June, though cases of ardent fever and sunstroke are then of occasional occurrence, and cholera and small pox generally prevail more or less, but principally among the native population. It must be stated, however, that the excessive heat depresses and relaxes the system, and produces a tendency to the diseases which the succeeding cold and wet season developes. July, August, and September are the most unhealthy months. Hepatitis, dysentery (sometimes of a malignant type), and diarrhœa and fever (common, continued, and ephemeral), occasionally of a remittent, and sometimes typhoid form, are the prevalent diseases. 4. The only district near the station which may be at all considered more healthy is the table land of Bedur, about 70 miles from Secunderabad. Its elevation above the station is only about 500 feet, by a gradual ascent of the intervening country, and it is about 150 feet above the level of the plains immediately below. Its drainage is perfect, the ground sloping in all directions to the lower country, and the soil being hard and gravelly. The water is very good, and the supply abundant, procured from very deep wells, with but two exceptions that I know of, and those are a fine spring near Khanapore and a warm spring from the hill side near the town of Bedur. Although the elevation is but slight, still, looking down from the table land to ground on a lower level, something of the indefinable effect of a hilly country is imparted, and the whole aspect of the surface of the plateau is entirely diverse from that of the vicinity of Secunderabad, the geological formation being the *laterite*, a clay ironstone, exhibiting none of the rocky elevations which so abound about Secunderabad, and which certainly produce unfavourable effects on the atmosphere, as to absorption and radiation of heat, if not in some less appreciable electric or other conditions of the air. An outpost established here, say for two companies of infantry, with frequent reliefs, and hospital accommodation for about 50 patients, would form an agreeable and beneficial change for the European troops of this large force, and very many invalids would certainly benefit by the journey thither, and the change of air and scene. 5. The stations at which I have served are Trichinopoly, Belgaum, Palaveram, Madras, Bellary, French Rocks, Bangalore, Mercara, in India; Meeaday and Tonghoo in Burmah, all salubrious; Bangalore and Mercara decidedly conducive to health; Secunderabad I consider less salubrious than the others, on account of its changeable climate. Mangalore, Palamcottah are not conducive to health. Kolengsoo and Hong Kong, in China, and Prome, in Burmah, are decidedly injurious. (Signed) E. Apthorp, Brigadier Commanding Hyd. Sub. Force. The stations at which I have served are Madras; climate hot and debilitating, but, for an inter-tropical place, not insalubrious; St. Thomas's Mount, near Madras; its climate partaking of the same characteristics; Palaveram, near Madras, inland, of the same character generally, but hotter; Kulladghee, S. Mahratta country, intensely hot during part of the year, cool and bracing for four months; not insalubrious for a place within the tropics - Cannonore, very humid climate, relaxing and enervating; Bellary, hot and dry, not conducive to health; Bangalore, on a table land, generally very salubrious; hot season very short, and not so intense as in the lowlands; Secunderabad, climate trying for its vicissitudes; certainly not conducive to health, and without care and temperance positively injurious. (Signed) Robert Cole, Deputy Inspector-General Hospitals, H.S.F. I have served at the stations of St. Thomas's Mount, Kamptee, Saugor, Mhow, and Secunderabad. The two latter I consider the most healthy. Saugor was always considered feverish. Kamptee, on account of its extreme heat, was a bad station, and St. Thomas's Mount was healthy, but very hot. Kamptee is the only one which I consider positively injurious. (Signed) Francis Hastings Cobbe, Capt. Ex. Engineer.
III. Sanitary Condition of Station.	1, 2, 3. Maps and plans. 4. The following table shows the barrack accommodation. Date of construction.—Madras Artillery and Old Barracks, not known; Trimulgherry Barracks, 1858. Total number of rooms or huts, 148. Total regulation number of non-commissioned officers and men, 1,961.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.			Doors.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.	Number.	Height.	Width.
								Ft. In.		Ft. In.	Ft. In.		Ft. In.	Ft. In.
Madras Artillery:														
2 Rooms - -	88	274	18	18	88,776	1,008	56	1 6	41	4 8	3 8	Arch 1 „ 6	12 0 7 5	9 0 3 5
10 Serjeants' Rooms	1	16	10	16	2,560	2,560	160	1 6	1	4 0	3 0	1	7 0	4 0
Old Barracks:														
2 Rooms - -	49	124	18	22	49,104	1,002	46	1 6	—	—	—	26	8 0	4 0
4 Serjeants' Rooms	1	19	12	14	3,192	3,192	228	1 6	2	5 1	3 0	1	8 0	4 0
4 Rooms - -	64	164	18	22	64,944	1,015	46	1 6	—	—	—	30	8 0	4 0

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Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Doors. Number.	Height.	Width.
								Ft. In.		Ft. In.	Ft. In.		Ft. In.	Ft. In.
Old Barracks—*cont.*														
16 Serjeants' Rooms	1	19	10	14	2,660	2,660	190	1 6	2	5 1	3 0	1	8 0	4 0
1 Room - -	90	229	18	22	90,684	1,007	51	1 6	—	—	—	42	8 0	4 0
4 Serjeants' Rooms	1	19	11	14	2,926	2,926	209	1 6	2	5 1	3 0	1	8 0	4 0
1 Room - -	83	210	18	22	83,160	1,020	45	1 6	—	—	—	38	8 0	4 0
4 Serjeants' Rooms	1	19	11	14	2,926	2,926	209	1 6	2	5 1	3 0	1	8 0	4 0
Trimulgherry Barracks:														
10 Rooms - -	104	173	24	25	103,800	1,003	40	1 6	—	—	—	Arch 2	13 6	10 0
												„ 30	8 7	4 7
10 End Rooms -	11	20	24	24	11,520	1,047	43	1 6	—	—	—	„ 2	13 6	10 0
												„ 2	9 0	4 6
40 Serjeants' Rooms, (inner) - -	1	20	15	18	5,400	5,400	300	1 6	—	—	—	3	9 0	4 6
40 do. (outer)	1	20	15	18	5,400	5,400	300	1 6	2	6 0	4 6	2	9 0	4 6
Guard Rooms.														
Madras Artillery:														
1 Room - -	10	41	16	16	10,496	1,049	65	1 6	4	4 2	3 $2\frac{1}{2}$	1	6 6	3 $3\frac{1}{2}$
1 do. - -	4	15	16	16	3,840	960	60	1 6	2	3 $8\frac{1}{2}$	3 1			
									—	—	—	1	6 6	3 $3\frac{1}{2}$
Old Barracks:														
1 Room - -	4	30	10	15	4,500	1,125	75	1 6	2	5 1	3 2	4	8 2	4 8
1 do. - -	11	30	18	22	11,880	1,080	49	1 6	2	5 1	3 2	2	8 2	4 8
1 do. - -	5	30	12	15	5,400	1,080	72	1 6	2	5 1	3 2	2	11 9	10 0
1 do. - -	12	31	18	22	12,276	1,023	47	1 6	—	—	—	2	11 9	10 0
Trimulgherry:												1	8 0	4 6
1 Room - -	20	21	47	21	20,727	1,036	49	1 6	3	6 0	4 6	6	9 0	4 6
3 do. - -	11	30	19	21	11,970	1,088	51	1 6	3	6 3	4 6	2	8 3	4 6
Prison Cells.														
Madras Artillery:														
4 Cells - -	1	8	8	10	640	640	64	1 6	—	—	—	1	6 0	2 0
Old Barracks:														
10 Cells - -	1	8	8	12	768	768	64	1 6	—	—	—	1	6 0	2 6
Trimulgherry:														
32 Cells - -	1	13	10	16	2,080	2,080	130	1 6	—	—	—	1	6 6	3 0

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. There are no windows in the barracks, except in serjeants' and end rooms, and in the artillery barracks. Large double doors, glass and Venetian, are all on opposite sides, and open, the former inwards and the latter outwards. In the artillery barracks the windows open inwards. The artillery barracks have a verandah on both sides, the whole length 18 ft. 6 in. broad. The old barracks have double verandahs on each side. The breadth of the outer verandah is 10 feet, and of the inner 12 feet; the Trimulgherry barracks the same: breadth of each 12 feet. The inner verandah of the Trimulgherry barracks only is occupied by the soldiers, in consequence of a battery of artillery being located in them, in addition to the regiment of infantry. This arrangement is temporary only. The old barracks and the new infantry barracks have properly constructed jhilmils. The artillery barracks have none. (Remark by H. E. Com. Chief.—The barrack accommodation at Secunderabad is accurately described in my inspection tour, Report of February 1859. (Signed) P. G.) 6. In barracks cots are supplied composed of three boards each, 6 ft. 4 in. by $10\frac{3}{5}$ in. by $1\frac{1}{4}$ in.; two truss heads, each 2 ft. 7 in. × $4\frac{1}{2}$ × $2\frac{1}{2}$; eight truss legs, each 1 ft. 5 in. × $2\frac{1}{2}$ × $2\frac{1}{2}$ at the top, and × $4\frac{1}{2}$ × $4\frac{1}{4}$ at the bottom. The bedding consists of one cotton settringee, the size of the cot; two upper sheets; one quilt of double chintz, 7 ft. 4 in. × 4 ft. 4 in., containing four seers of cotton; one good blanket, to measure, when double, 7 ft. × 4 ft. No improvement can be suggested. In tents cots are used, but the flooring of tents is covered with tarpaulings in wet or damp weather, and with straw in dry. Men's bedding is carried for them on the march. (Remark by H. E. the Com. Chief.—For upwards of four years I have made every effort in my power, but with little effect, to obtain iron cots of an improved pattern for the whole of the European troops in the Madras Presidency. (Signed) P. G.) . There are two descriptions of tents in use with troops. The tent European for European troops, and the tent native for native troops. The tent European is an oblong in shape, the tent native elliptical, with only one entrance. Their dimensions are,—tent European, 21 ft. × 15 ft.; cubic space, 109 feet; superficial space, 13 ft.: tent native, 22 ft. × 12 ft.; cubic space, 71 ft.; superficial space, 8 ft. Twenty-five men are allotted to each tent, but, from separate tents being provided for the hospital and the guards, it never happened that 25 men occupy a tent at any time. 8. The barracks and guard rooms are ventilated by doors and windows, by ridge ventilation in tiled buildings, and skylights and upper wall ventilators to terrace buildings. There are no huts. The tents are ventilated by the doors. The ventilation is quite sufficient to keep the air pure by night as well as by day, if proper attention is paid to keeping the ventilators open. Means of cooling are by kus kus tatties to the doors and windows kept constantly saturated with water during the hot months. They are constructed by attaching the dry kus kus grass to a frame work of split bamboo. The cost of a door tatty, 6 ft. × 9 ft. is eight rupees, and of a window tatty 6 ft. × 7 ft., six rupees eight annas.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	9. Barracks are constructed of brick in chunam by a recent order of the Government of India; mud and clay is to be substituted for chunam, except for basements and the few upper feet of walls. Barracks are tiled or terrace-roofed. Tents are constructed of good, strong Punjaree cloth, lined with blue dungaree. There are no huts. 10. Floors are constructed of granite. In the old barracks they are not altogether well raised above the level of the ground. In the Trimulgherry barracks they are well raised about four feet. The artillery barrack floor is also well raised. None of them have a passage for air underneath. The height of flooring from the ground is as follows:— Madras Artillery barracks, 1 ft. 6 in. average. Old barracks, 1 ft. 6 in. average. Trimulgherry barracks, 4 feet. 11. The materials and construction of barracks are perfectly suitable for the climate. A great improvement in these points has taken place within the last few years. Barracks are kept in repair by the executive engineer, and the roads by the assistant quarter-master general. Repairs are quickly executed. The deputy inspector general of hospitals, or senior medical officer present, is responsible for the general sanitary state of the cantonment. There is no prescribed time laid down by the Bengal Public Works code for cleansing and limewashing the walls and ceilings of barracks, but it is done whenever required. 12. There are two descriptions of lavatories, one the plunge bath, and the other the washhouse. Into the former the men plunge. In the latter there are tubs, and shelves for basins, and grated floors to keep the men's feet dry. They are supplied with water, the former from wells adjoining, from which the water is raised by bullocks; the latter are supplied by puckallies. In the artillery barracks there is one plunge bath and three washhouses; in the old barracks one bath and seven washhouses; and in Trimulgherry barracks three baths and ten washhouses. In the artillery and old barracks the water runs off into the general drainage. No drainage has yet been supplied at Trimulgherry. 13. Each separate barrack is provided with its cook-house. The means of cooking are as follows:—Two ration baskets; one copper boiler 9½ gallons, one 6½ gallons, with covers and ring handles; and one iron frying-pan are supplied to every 25 men. There is a table to each cook-room with a proportion of chopping blocks and 13 (qy. 3) lbs. of firewood per man daily. Water is brought by puckallies. The refuse water is drained away in the same way as from washhouses. Linen is washed and dried by dhobies (washermen), who are to be obtained without difficulty. 14. The privies have a drain along their rear, leading to a small cesspool, into which any refuse liquid escapes and is removed daily. The solid filth is removed daily by scavengers' carts to a distance. 15. The privies are ventilated by means of ridge ventilators, and some have ventilators in the walls also. A tin lamp is allowed to each privy. The barracks are lighted at night by globe lamps, one to every 12 men. 16. The drainage of the old barracks is now undergoing great improvement. Two extensive main drains are under construction, one on either side of the barrack enclosure, into which all minor drains from the barracks debouche. These two drains empty themselves into cultivated ground at the distance of 467 yards from the barracks. The dimensions of these main drains are in feet four by three at the broadest part. The drainage of the artillery barracks is good, and the outlet into a large pit in the soldier's garden distant from the barracks 140 yards. There are no sewers. No system of drainage of any kind has yet been established at Trimulgherry, but an estimate amounting to a very large sum is before Government for sanction. When the drainage of the old barrack is completed it will be ample. That of the artillery barrack is quite sufficient. (Remark by H.E. the Commander-in-Chief.—On this point see my Report of February 1859. (Signed) P. G.) No part of the barrack or hospitals is damp. At Trimulgherry the fluid refuse of the barracks is at present left to evaporate, but from all these buildings being erected on high ground, it runs off to a considerable distance, where it sinks into the subsoil. There are no cesspits. There is a nullah, which intersects or divides the main portion of the cantonment, occupied by the European portion of the community, from the bazaar, which is at times very unpleasant. 17. The extent of the cantonment is so enormous as to preclude any general surface cleansing, but parades and lines are kept clean by the followers attached to regiments; the bazaars by arrangements made by the superintendent of police; and the roads by the road department. Cleansing is done whenever required, and efficiently, by scavengers' carts being employed. Manure is either sold or removed. 18. The cantonment is singularly bare of vegetation. There are no old walls, hedges, &c., to interfere with ventilation. 19. Every main street of the bazaar has a subterraneous drain in the centre, into which all minor drains converge, and which carries off rain water and filth. In a few of the back streets, however, this drain does not exist. A large portion of the bazaar is on high ground, so that on the whole the ventilation is good. There are many wells, but in some the water is brackish, and in the hot season water becomes scarce. In the hot season of the present year, 1860, the greatest inconvenience was experienced; bazaar people having to resort to wells outside during the greater portion of each night to obtain a sufficient supply for their wants by day. Latrines have been built. The bazaar is not overcrowded. The superintendent of police visits the bazaar once a week, and fines those in front of whose houses any filth or nuisance is found. Privies exist in convenient places, which are cleaned daily, and to which persons who have no privies are ordered to proceed. Natives, however, have a great repugnance to privies, and there can be no doubt that this order is extensively evaded. The houses in the bazaars both within and near the station are generally in good order. No dung heaps or cesspits are allowed in the bazaars within cantonment limits. Outside our authority ceases, and all belongs to H. H. the Nizam. There is no nuisance whatever experienced from wind blowing over the native dwellings. 20. The place where cows and bullocks are slaughtered is situated at a very short distance from the limits of the bazaar. There are two fixed places for slaughtering sheep, one in the middle of the bazaar about half a mile from the European portion of the station, and the other about three-quarters of a mile. The slaughter of cattle in other than the above places is strictly prohibited. The offal is sold to the villagers, and removed by them daily. No nuisance is experienced in the station from the condition of the slaughtering places.

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station	21. The few horses there are in the bazaar belong generally to wealthy men, who build stables for them. There is no picketing ground in the bazaar. Every person who keeps a horse is responsible for the state of his stable. The manure is purchased by pot and brick-makers and is removed daily.
	22. None of the mounted corps are provided with stables. The distance of the dung-heaps from the soldiers' rooms and hospitals is as follows:—

——	Barracks.	Hospitals.
Royal Horse Artillery	200 Yards.	800 Yards.
„ Horse Field Battery	700 „	700 „
Madras Artillery	280 „	200 „
Dragoon Regiment	640 „	970 „
Native Cavalry	*308 „	504 „

* From the men's hutting lines.

The manure is sold and taken away. The horses of the Royal Artillery are picketed in walled enclosures convenient to the barracks they temporarily occupy. One side of these enclosures is formed by the sick stables, shoeing sheds, &c.; another by the gun sheds. The horses of the Madras artillery and the European and native cavalry are picketed in enclosures surrounded with four walls and divided into rows, and with streets separating the different divisions and troops. The distance and position of these horse lines as regards the men's accommodation and the hospitals are as follows:—

——	Barracks.	Direction.	Hospitals.	Direction.
Royal Horse Artillery	40 Yards.	W.	570 Yards.	N.
„ Horse Field Battery	60 „	E.	640 „	N.E.
Madras Artillery	450 „	N.	640 „	N.
Dragoon Regiment	120 „	S.E.	453 „	S.E.
Native Cavalry	360 „	N.W.	100 „	W.

23. There is sufficient accommodation for married people, none of whom occupy barrack rooms with the men.

Officers' Quarters.

1. There is only one range of officers' quarters yet completed, viz.:—That for the subalterns of the infantry regiment at Trimulgherry. It is only just finished, and it is too soon to form any opinion on its sanitary conditions. There is no other than surface drainage; the ventilation is excellent. I have no improvements to suggest, for the reasons given above.

(Remark by H. E., the Commander-in-Chief. In reference to the health of the troops at Secunderabad for the last 30 years, see appendices to my Report of February 1859.

(Signed) P. G.)

IV. HEALTH OF THE TROOPS.

1. The station may be pronounced as generally healthy, but for occasional outbreaks of endemic disease, the same may be said of the district, and the population generally are hale and robust looking, but in the crowded neighbouring city of Hyderabad there are all the influences at work which tend to cause and to propagate zymotic disease.

2. The diseases most prevalent among the native population are cholera, small-pox, diarrhœa, and dysentery, Guinea worm, rheumatism, and fevers, (but not intermittent, to a great degree of a decidedly malarious form,) often producing spleen disease, though not as a constant or very marked consequence. Bronchitis in cold and wet seasons, when occasional attacks of pneumonia occur both among Europeans and natives.

3. The elevated table-land of the Deccan is for an intertropical region of an invigorating character as to climate to the natives of the country, who also seem never to lack the means of obtaining a livelihood, so are generally well fed. The unhealthiness which is observed, may be attributed to the intense heat of one period, followed by wet and cold with great vicissitudes of temperature. In the city of Hyderabad, and in some degree, though very much less in the town and bazaar of Secunderabad, overcrowding and want of attention to drainage and general sanitation produce disease among the population.

The following are the stations at which the troops have previously served:—

H. M. 17th Lancers.—Gwalior, Bengal; eight months. Left 10th January 1860. Health indifferent; intermittent fever and diarrhœa. On arrival at Secunderabad, 3rd April 1860, health good, but suffered on the march from cholera. Fever, dysentery, and diarrhœa have prevailed since arrival.

H. Battery, H. Brigade, Royal Artillery.—At Saint Thomas' Mount for twelve months; left on the 3rd December 1858. Suffered there from fevers of a low type, dysentery, and cholera. On arriving here the 21st January 1859, several men in the last stages of hepatic disease, from which class of disease they suffered severely for several months; during the last twelve months their health much improved. Suffering from mild forms of dysentery, fevers, and hepatic diseases.

No. 2 F. Battery, 13th Brigade, Royal Artillery.—At Bellary before arriving here for four months, and left on 8th November 1858. State of health tolerably good. Diseases of stomach and bowels and liver, and ephemeral fevers. Arrived here 5th December 1858 in very good health, and have continued so. Prevailing diseases, those of the stomach and bowels, and liver. Many cases of ephemeral fever.

No. 8 Battery, 13th Brigade, Royal Artillery.—Saint Thomas' Mount for a fortnight after arrival from England; health good. Left in March 1858, and arrived at Secunderabad in May, in good health. Have suffered from sun fever, intermittent fever, dysentery, and diarrhœa since, and a few cases of cholera.

4th Battalion, Madras Artillery.—Banda, north-west provinces of Bengal. On field service for the last two and a half years. Left 19th January 1860. On the whole, health very good

References to Subjects and Queries.	Replies.
IV. Health of Troops—*cont.*	on field service. General type of disease, febrile and local, with a few bowel and hepatic cases. Arrived at Secunderabad 3rd May 1860. Health very good. Diseases since arriving, intermittent fevers, diarrhœa, dysentery, and venereal, but scarcely any of a very grave nature. *H. M. 1st Battalion, 1st Royal Regiment.*—Camp "Curragh" for twelve months; left 25th July 1857. General health good; prevailing diseases, venereal and pulmonary complaints. Arrived at Secunderabad 12th December 1857, remarkably healthy, and continued so until following June; suffered much from dysentery and liver complaint, and fever of the intermittent or remittent form. Total number of deaths up to present period, 162(?). No invalided to England. *H. M. 1st Battalion, 18th Royal Irish Regiment.*—Broken up into numerous detachments on field service, from May 1858, when the 1st detachment left Poona, to June 21st, 1859, when the head-quarters and five companies arrived at Secunderabad. Several detachments had suffered much from sickness in the summer of 1859; cholera and other forms of bowel complaints prevailed. Head-quarters and five companies arrived here on 21st June 1859 in an indifferent state of health; the remaining companies rejoined during the spring of 1860. Fevers, bowel complaints, and hepatic affections since arriving. *5th Regiment, Light Cavalry.*—Bellary, one year, six months, and eight days; left 9th November 1858; health good. Diseases, febris quotidiana intermittens, rheumatismus chronicus. Health on arrival very good. Arrived at Secunderabad 6th December 1858. Febris quotidiana intermittens, ulcers, cholera, and diarrhœa have been the diseases since arrival. *10th Regiment, Native Infantry.*—Rangoon three years; left 10th March 1858. Health generally good: principal diseases, dysentery, diarrhœa, dropsies, rheumatism, ulcers, and diseases of the skin; fevers, chiefly of quotidian type. Healthy on arrival at Secunderabad, 3rd May 1858. Fevers, chiefly quotidian, diarrhœa, dysentery, dropsies, rheumatic affections, abscesses, ulcers, diseases of the skin, and cholera, have been the diseases since. *19th Regiment, Native Infantry.*—Saugor, seven months; left 29th December 1859. Suffered a good deal from fever in September and October. Regiment arrived here 9th March 1860 in good health. For a month past fever and rheumatism very prevalent. *47th Regiment, Native Infantry.*—Bellary; there stationed nearly two years; quitted Bellary 9th November 1858. Health there very good; intermittent fever and rheumatism were the diseases. Arrived here in good health, 3rd December 1858. Ephemeral, quotidian, and other fevers, Guinea worm, rheumatism, and cholera have prevailed since. *49th Regiment, Native Infantry.*—Kurnool, from the 19th March to 20th November 1857. Suffered there from dracunculus, fevers, and rheumatic affections. 7th December 1857, arrived at Secunderabad with few sick. Cholera, fevers, and dracunculus have prevailed since arrival. 4. The site of the old barracks for the European infantry regiment (now occupied by a cavalry corps of 17th Lancers) has been very notorious for unhealthiness, owing, it would appear, to the barracks being ill-ventilated and over-crowded; to the ground being low, with rocks on one side and grounds under wet cultivation on the other (the latter not belonging to the British Government, and therefore not under subjection to sanitary conservancy). Great improvements were effected in the barracks previous to their occupation by the 17th Lancers, and everything has been done that it is possible for the local authorities to effect, to improve the sanitary condition of the neighbourhood. The lines of one of the native infantry regiments have also been more unhealthy than others, owing to their site being low, a large tank (Hoossain Sagur) on one side, and the town of Secunderabad closely contiguous. 5. The troops are not camped out as a regular practice, but on occasions of sickness prevailing it has been resorted to with good effect. (Remark by H. E. Com. Chief.—The 17th Lancers have lost 15 men by death in the barracks they now occupy, in six months, the total strength of the regiment being 600 men. (Signed) P. G.) 6. The deputy inspector-general of hospitals, who signs these replies, had, in another division, a sanitarium (Ramandroog) within his circle of superintendence, and the result of residence there on the health of invalids was in most cases very salutary. 7. Experience has not been sufficiently extensive to come to a conclusive opinion whether troops resident for some time in hill stations are more or less liable to disease on returning to the plains. 8. We most highly approve of selecting hill stations for troops. 9. Answers as to the diseases peculiar to hill stations will be received from officers whose experience will enable them to afford information. 10. Information respecting precautions as to diet, clothing, &c., will also be obtained from the above sources. 11. The hill stations vary infinitely, and the particulars respecting them will, no doubt, be afforded by officers who have had experience of each. 12. In our opinion there is certainly no period of residence beyond which injury is likely to be inflicted on the health of troops returning to the plains. 13. We know of no *special* precautions to be observed by troops on leaving hill stations, but only the established rules for the care of Europeans in a tropical country; above all, abstinence (if possible) from the use of ardent spirits, and, of course, avoidance of all unnecessary exposure to the sun's rays; the use of light body clothing, and protection of the head by a light helmet with non-conducting cover. 14. There are no sufficient data in Southern India, except perhaps in the case of the sanitarium of Wellington, on the Neilgherries, to enable a valid opinion to be formed whether it would conduce to the preservation of the health of troops to locate them on hill stations with short periods of service on the plains. Frequent change is beneficial, but there is the disadvantage of the great chance of sickness breaking out among troops while under movement. 15. No reply. 16. The range of elevation most suitable for hill stations must greatly depend on the character of the hill or mountainous range. A spot 3,200 feet above the sea level, on the slopes of the Neilgherries, would be in the midst of a malarious jungle; but the top of Ramandroog at that elevation is salubrious, because it forms part of a limited range of hills, surrounded by vast plains, with no thick forests at their base. The salubrity of any particular altitude will always be influenced by such and other like considerations. 17. Ramandroog is the established sanitarium for European troops at Secunderabad, 250 miles distant; there being no nearer place which could be occupied as a hill station, though

References to Subjects and Queries.	Replies.
IV. Health of the Troops—*cont.*	the table-land of Bedur, mentioned under a previous head, offers minor advantages of no inconsiderable value. Speaking generally, the diseases from which the European soldier suffers at Secunderabad are not such as are benefited by a hill climate: it may be rather said that they are prejudicially affected by it, dysentery and hepatitis leaving organic changes behind them which render relapses more liable in an intertropical hill climate. What is perhaps more wanted than a hill sanitarium is a good place of resort at the sea-side for invalids from this station. Masulipatam, 200 miles off, the nearest port, is a very unfavourable place for such an object, but good sites exist further north at Cocanada or Vizigapatam. A sea voyage from Masulipatam to either of the above places would do good; and if it were prolonged for two or three weeks it would be so much the better. A hill has been explored near Vizigapatam, which it is believed will be found suitable as a sanitarium. Should it turn out to be so, a sea voyage and short residence on the coast would be very advantageous preparation to very many of our sick, before resorting to the hill climate; for after such a preparation very many cases might safely be removed to the latter which it would not do to send abruptly thither. 18. There is a great similarity in the surface and subsoils of the stations of Southern India, being mostly on tracts of primitive formation. 19. Soldiers should not be sent to India under 20 years of age, and should arrive there drilled soldiers. November and December is the best period for them to land. The precautionary measures for preserving the health of troops on first landing in India may be all comprised in such attention as shall, if possible, ensure *temperance*, and avoidance, as much as may be, of exposure to the sun. 20. It seems to us a doubtful point, and still *sub judice*, whether troops should be sent direct to India from home, or to intermediate stations. A climate like that of Bangalore on the Mysore table-land, intermediate between the heat of the plains and a hill climate, is the best for seasoning newly arrived Europeans. 21. Troops are generally conveyed from Masulipatam to Secunderabad by what is called "transit," *i. e.*, by successive batches in carts, with relays of bullocks. This applies to detachments, but a whole regiment might be so moved, though the time occupied would be great. Still much sickness may be avoided by this mode, saving, as it does, the necessity of a great encampment, whereby disease is engendered and propagated. Rest houses at stated intervals on the line of road might be built. The system of transport is in good working order. 22. Twelve years' service in India is sufficient for soldiers, if belonging to home regiments doing duty in India; but there are fine old seasoned soldiers in the Indian army who are in their prime after such period of service, and go on till 20 or 25 years perfectly effective. 23. There seems nothing to desire in the manner of conducting medical boards at this station. 24. The time of year most suitable for invalids to leave India for home is from the 15th January to 15th March.
Diseases.	1. There are regular weekly inspections of the men of the European corps by a regimental medical officer, for the discovery of incipient diseases. The practice does not prevail in corps of the native army. 2. Scorbutus has not prevailed lately at this station, nor does it appear by the records to have ever prevailed here in a decided form, or to any notable amount. 3. During the last four years, 1855 to 1859, the total number of European sick treated was 10,423, out of which number there were 712 cases of hepatic disease, giving a proportion of 6·84 per cent. The above period includes one year in which hepatitis was particularly prevalent, and in which there were many cases terminating fatally, with hepatic abscess secondary to dysentery, and which appear in the returns under the latter disease. The greater number of the cases are simple, uncomplicated hepatitis, some following dysentery, and some produced by the congestion caused by intermittent fever. In the same period, out of 21,770 native sick, there were only 50 cases of hepatic disease, being 0·23 per cent. Prophylactic measures consist of every possible discouragement to the use of ardent spirits, avoidance of all unnecessary exposure to the sun, great care as to protecting the surface of the body, especially the abdomen, against the chills so frequently caused by the cold winds and vicissitudes of this climate. 4. Among Europeans, out of the above number of sick (10,423), there were only 10 cases of dracunculus. Among the 21,770 native sick, there were 601 cases, chiefly in two out of the five sites occupied by native corps. The origin of these parasites, and whether they form in the body or their ova are introduced from without, being in obscurity, no prophylactic measures that we are aware of promise to diminish the frequency of this disease. It is unquestionable, however, that the subjects of this and other forms of parasite which infect the human body are usually in a state of enfeebled health from other causes, and the situation of the native infantry lines on the Hoossain Sagur tank, where dracunculus most prevails, is such as, from the causes enumerated under another head, will induce deterioration of the general health and zymotic disease. 5. During the four years named above, 1855 to 1859, out of the 10,423 European sick, there were 2,038 venereal cases, being 19½ per cent. of the whole number. Out of 21,770 native sick, there were 938 venereal cases, being 4·29 per cent. A lock hospital has been established here for several years, with excellent results, both as to diminution of disease and lessening the severity of its character. 6. The epidemic and endemic diseases from which the troops at this station suffer are as follows: Fevers of the true intermittent type from malarious causes are rarely of an aggravated character, but the cold and wet season is apt to produce relapses of ague in those who have been previously subject thereto. Common, continued, and ephemeral fevers prevail to a great extent among the native troops in the cold and wet weather, sometimes assuming a quotidian or tertian form, and also among Europeans in a less degree. The spleen often becomes enlarged in natives, sometimes without marked ague. In the European soldier, an obscurely remittent fever, with an adynamic character, often running into confirmed typhoid, prevails during and immediately after the rains, and this was particularly observable at the time when asthenic dysentery prevailed last (in 1858), showing an apparent connexion in their etiology. Dysentery is the disease for which Secunderabad has obtained so unhappy a notoriety as an unhealthy station for Europeans. It may be said to be the endemic of the place, particularly among Europeans, during the wet months and immediately after, some years attaining a fatal malignancy, as in 1858, at others bein of the ordinary type, and not prevailing to so inordinate a degree.

References to Subjects and Queries.	Replies.
IV. Health of the Troops—*Diseases—cont.*	Cholera prevails generally in the hot season, more or less, but not in a very marked degree in Secunderabad among the troops. The city of Hyderabad is a hot-bed of this disease when the tendency to it becomes developed, and from thence it extends by the frequent intercommunication of the people to Secunderabad, whence the cantonment becomes infected, as was observed in a marked manner last year (1859), when 98 cases of cholera occurred, 15 among Europeans and 83 among native soldiers, five of the former having died, and 49 of the latter. Small pox prevails, more or less, yearly in the hot season, but never to a formidable extent among the troops, vaccination being carefully performed. Rheumatism is very prevalent in the damp and cold weather, especially among natives. The following table shows the proportion of admission and deaths from these diseases :

Official Years.	Europeans.												Natives.											
	Principal Diseases.												Principal Diseases.											
	Numerical Strength.	Total Admissions from all Diseases.	Total Deaths from all Diseases.	Fevers.		Cholera.		Dysentery.		Small Pox.		Rheumatism.		Numerical Strength.	Total Admissions from all Diseases.	Total Deaths from all Diseases.	Fevers.		Cholera.		Dysentery.		Small Pox.		Rheumatism.	
				Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.				Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1855-56 -	1,117	2,491	23	658	4	2	1	286	10	—	—	58	—	6,505	6,148	65	3,891	17	24	6	66	5	19	—	368	1
1856-57 -	1,016	1,647	16	388	1	5	1	130	4	—	—	46	—	5,306	6,013	63	3,229	16	27	15	72	3	2	—	353	2
1857-58 -	1,607	1,493	18	258	5	9	3	74	3	1	—	53	—	3,496	3,743	36	1,328	9	2	—	54	3	33	1	399	—
1858-59 -	2,212	4,792	155	687	17	1	—	952	68	3	1	138	1	4,703	5,866	38	2,638	14	145	56	95	5	19	1	351	1

7. The zymotic diseases, which more generally prevail here, are those affecting the chylopoietic viscera. In years when bowel affections and hepatitis prevail, they originate during and immediately after the rains, from June to September. The climatic and atmospheric conditions are damp and cold succeeding intense heat, the cold being in the intervals, but more especially after the rains, very dry, parching the surface while it chills, tending to produce visceral congestions. That part of the station which in former years has proved so unhealthy, has been so much improved as regards cleanliness, drainage, water supply, and ventilation, &c., that a hope may fairly be entertained that disease will not prevail in future here more than in other sites in the cantonment. Great attention is paid to cleanliness, both as to the persons of the men and that of their barracks and out-offices. The excreta are removed in tubs from the privies and carried on carts to a distance. There are no cesspools for excrementitious matters. The drainage, when the system laid down is completed, will be very good near the barracks, but, as has been intimated, the British jurisdiction ceases at a quarter of a mile from the barracks, and at this point there is a low tract under cultivation, chiefly wet, and here sanitary conservancy must cease, though it is most desirable that control over the line of drainage should exist for at least half a mile farther on, or else it will be liable to stagnate at this point, and cause malaria. The ventilation of these barracks is good, by numerous doors, and by ridge openings in the central apartment, and openings in the roofs of the inner verandahs. Over-crowding cannot take place with a corps of the cavalry strength. There are eight barrack rooms of the aggregate cubic area given below. In each of these, allowing for absentees in hospital, on guard, &c., 60 men sleep nightly, which gives 1,800 feet of atmosphere per man. The men sleep in the centre apartments, and no cots are placed in the enclosed inner verandahs. There are outer verandahs also to these buildings.

Cubic Area of 8 Barrack Rooms.

Main Wards.	Inner Verandah.	Total.
447,883	427,105	874,988

(Remark by H. E. the Commander-in-Chief.—And yet with all these improvements the 17th Lancers, strength 600 men, have lost 15 men by death in these barracks in six months. (Signed) P.G.)

8. The soldier's duties have no effect in influencing epidemic disease; his occupations in barrack being monotonous and unvaried, he has nothing to divert his mind from idle habits, or evil practices, if he is inclined to them.

9. There has been no systematic practice of the use of quinine, the prevalent diseases, if malarious, not being peculiarly of that nature in which quinine would be prophylactic.

10. For the prevention or mitigation of epidemic disease, I should recommend that the masses of rock jutting out of the soil, especially those near the buildings occupied by the men, should be removed as much as practicable: some might be blasted or split by lighting fires, and dashing cold water over the heated surface; other masses might be rolled over into pits dug for the purpose, and then covered over with soil. The soldiers, especially those of the mounted corps, require some protection from the cold dry wind, when they return heated and perspiring from exercise. They then throw off their jackets and remain in their saturated under-clothing, till dried and chilled by evaporation, whereby internal congestions take place, and bowel complaints and hepatitis follow. A coarse woollen wrapper, which the non-commissioned officers should see that the men put on at such times, would most probably avert disease. The men should have provided for them the means of amusement and recreation, both of an indoor kind, when heat or other bad weather prohibits their going out, and games and athletic sports, at seasons when such pastimes can be carried on. Encouragement should be given to gardening. A fine large building exists at

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	Trimulgherry, built as a reading-room and coffee-room, but appropriated as a barrack, on account of the great increase of troops, but when the barracks now erecting are completed, this building should be assigned for the use of the men, and enlarged, if necessary, or another built. Books, amusing games, and tools, with implements of various handicrafts, should be provided. By such means the *tedium vitæ* of a barrack would be dispelled, the mind recreated, time occupied which might otherwise be given to bad habits, disease averted, and mortality lessened. The neighbourhood of the old infantry barracks (now occupied by the 17th Lancers), should be most carefully conserved as to all sanitary points, obtaining command over the low ground, where, as previously observed, the drainage is liable to stagnate, should be insisted on; most careful observation should be made, as to whether, when all precautions are used, and all local apparent causes of disease have been as far as possible removed, this locality continues more unhealthy than other parts of the cantonment, and in such event, the site should be abandoned, and the cavalry corps be located elsewhere. The site in question has been formally condemned by a special board of medical officers appointed by Government to report, and its continued occupation is only because a large accession of European troops compelled its use; but it is considered possible that with all the improvements in the buildings that have been effected, the numbers occupying the barracks never exceeding what they are now, and a strict conservancy of the neighbourhood being maintained, no greater amount of disease and mortality may exist here than in other spots of the cantonment occupied by European troops. (Remark by H. E. the Commander-in-Chief.—See my former note respecting these barracks. (Signed) P. G.) The lines of the native infantry regiment situated between the town of Secunderabad and the Hoossain Sagur tank should be abandoned on account of their great unhealthiness. Guinea-worm prevails there to a great degree, and cholera when prevalent is sure to be found there. To a faulty mode of laying out the Sepoy lines, a great deal of fever, which affects the native troops, seems mainly attributable. The rows of huts are placed back to back, with an interspace of about three feet only, producing a gully, always damp in wet weather, where the sun cannot penetrate, and the air is confined. The foundations of both rows of huts must be greatly damped by this arrangement, and such a place is very liable to be resorted to for offensive purposes. Each hut has its own little enclosed quadrangle, which the dressers, who go to visit the sick of the families, report are very often in a most foul state, and indeed this may be pretty well surmised from the appearance of the small external gutter, which gives vent into the street to the fluids from within. The rows of huts should be opened out, and the courts paved with the granite, which is every where around so abundant, and splits into laminæ very convenient for the purpose.
V. Intemperance.	1. The average number of confirmed drunkards varies. In one regiment there are 7 per cent.; in another 1 in 30. 2. The proportion of admissions into hospital from diseases directly caused by intemperance, is 1 in $23\frac{55}{68}$; of diseases caused indirectly by intemperance, 1 in $1\frac{68}{1551}$. The following table shows the effect of abstinence, temperance, and drunkenness, on the amount of sickness mortality, and crime:—

Diseases.	Total Abstinence.		Temperance.		Drunkenness.		Total.		Punishment ordered by.	Total.		
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.		Abstinence.	Temperance.	Drunkenness.
Fever	59	—	112	2	78	—	249	2				
Cholera	—	—	2	1	—	—	2	1				
Dysentery, acute and chronic	53	—	178	6	147	—	378	6	Commanding Officer	5	769	378
Diarrhœa	18	—	40	—	28	—	86					
Other diseases of stomach and bowels	—	—	21	—	15	—	36	—	Regimental Court-martial		21	24
Ashalebes, acute and chronic	4	—	101	6	96	—	201	6	District		2	1
Diseases of the lungs	13	—	35	2	18	—	66	2				
Do. of the brain	—	—	3	1	4	—	7	1				
Rheumatic affections	18	—	29	—	20	—	67	—				
Venereal affections	46	—	135	—	102	—	283	—				
Dropsies	—	—	—	—	—	—	—	—				
All other diseases	48	—	129	1	67	—	244	1				
Total	259	—	785	19	575	—	1,619	19				
Average amount of strength	25		810		95		930					

Drunkenness is an offence and punished accordingly.

3. Arrack is sold in the canteen from the commissariat stores, and in some regiments brandy. Spirits are sold in the bazaar, but European soldiers are not permitted to purchase any. Spirit is no part of the soldier's ration, either at the station, on march, or in the field. It is never issued from the canteens before the dinner hour. The men are not in the habit of taking a dram before morning parade. As a rule, there are no convalescents, and a man though in weakly health, perhaps, and liable to relapse into disease, returns at once to barrack rations, with which spirits are issued on payment. No other drinks injurious to health are sold at the canteen or bazaar.
4. The consumption of spirits is certainly injurious to health; the amount allowed does not so much do the injury, as the authority and sanction given to spirit drinking by the issue thereof, and the desire for more, created in very many by the first dram indulged in, but the indiscriminate issue at all times and seasons, whatever may be the condition of the soldier at the time, is most pernicious. The consumption of spirits cannot be conducive to the discipline and efficiency of a regiment, but a moderate supply of good malt liquor is unobjectionable and generally beneficial.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	5. It would be beneficial to health to abolish the issue of spirituous liquors at the canteen; the quantity issued might not always be hurtful; but as an habitual practice, spirit drinking in any quantity is prejudicial, and total abolition is the only remedy. 6. The use of malt liquors or wines in moderation is very much preferable to spirits, and even if used freely are less injurious than an equal amount of spirits. 7. There is a large consumption of tea, coffee, and ginger-beer, but the price of lemonade and soda-water is too high to admit of a very extensive use of these beverages. Tea and coffee are more desirable than spirits and malt liquors, but the two former, early and late in the day, and a small quantity of malt liquor at the mid-day meal, would be better than total abstinence from spirituous liquors. 8. No doubt it would be beneficial to the health of the troops to suppress the spirit ration, and to issue beer, tea, coffee, &c. 9. It would be beneficial to health to permit only tea, coffee, beer, &c. to be sold to the troops. 10. If beer or porter could always be procured the spirit ration should be discontinued, except when troops are serving in the field. 11. The bazaar regulations in regard to selling spirits are to be found only in the regulations of the Madras Government and Act of the Supreme Government, vide section xvi. and sections xliii., xliv., xlv., xlvi., and xlvii. of Regulations vii. of 1832, and Act xviii. of 1853. These are far too voluminous for entry here. They are strictly adhered to. The canteen regulations are as follows:—At ¼ to 12 a.m. daily the canteens are opened for issue of porter to companies for the dinner meal. From ½ p.m. to 3 p.m. opened again for issue of malt liquor only. From 6 p.m. to 8 or 9 p.m. again opened for sale of malt liquor. The allowance daily to each man is 2 pints of malt liquor and 1 dram of arrack, or 2 drams of arrack if malt liquor is not taken.
VI. Diet.	1. The daily ration for the European soldier is 1 lb. meat, 1 lb. bread, 4 oz. rice, 1 oz. salt, $\frac{5}{7}$ oz. tea, or $1\frac{5}{7}$ oz. coffee, $2\frac{1}{2}$ oz. sugar, 1 lb. vegetables, 3 lbs. firewood. The articles of ration are the same the whole year round, with the exception of vegetables, the supply of which varies with the season, a due proportion of potatoes being provided for all seasons if procurable. The contractor is held responsible for the quality of the rations, and should there be any cause of complaint on account of inferior articles being supplied, he is fined. The rations are issued in the presence of the regimental authorities, and a warrant officer or staff serjeant of the commissariat. 2. A complete ration as above is supplied daily to the troops. The stoppage is 3 annas 4 pice a day. 1 lb. of vegetables is supplied to each soldier daily. 3. No improvement in the ration can be suggested. It has never been brought to notice that a soldier has attempted to sell any portion of his rations, hence no preventive measures have been adopted. 4. The means and apparatus for cooking have already been described. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. Meat is both boiled and stewed. Coffee is prepared daily by contractors, and taken to the barrack rooms, or to the tents on the march, before morning parade. Men may take it or not as they prefer. 5. Gardens for the cultivation of vegetables might be advantageously established. There are already soldiers' gardens in the vicinity of the European regiment barracks. It is desirable to encourage native cultivators to establish vegetable gardens, and to issue gratuitously to them European vegetable seeds.
VII. Dress, Accoutrements, and Duties.	1. The parts of a soldier's dress are a wicker helmet with wadded cotton cover for the heat of the day, forage cap for early morning and evening wear, except in the hot season, tunic of cloth or serge, or khakee, according to season, ankle boots, trousers, cloth or serge, or khakee according to season; khakee suit in hot weather and fatigue duties, vest of flannel, cholera belt, cotton shirt, woollen socks. Accoutrements according to regulation. The present dress being suited to the variations of temperature, is unobjectionable. The present helmet might advantageously be exchanged for one of a more durable and serviceable nature. The men mount guard according to season in khakee (that is summer costume), or cloth during cold or rainy weather. Sentries are either under roof or supplied with suitable sentry boxes.
Duties.	1. It is most desirable that recruits should be thoroughly instructed and drilled at home before being sent to India, particularly men of the mounted branches of the service. The hot seasons and rains retard a recruit's progress, and many young men break down with the fatigue of a course of drill in the hot season. 2. The men rise at gunfire from 4.30 to 5 a.m.; go to bed at from 8 to 9 p.m. Morning drills and parades are four per week for one hour, commencing three-quarters of an hour after gunfire in the morning, and in the evening for one hour, half the hour before and half after sun-rise. Drills are curtailed in length and few in number in the hot season. The amount of drill carried on is conducive to health. The best hours for drills, parades, and marches are those already established by Indian regulations, viz., between gunfire and 7 or 8 a.m. and between 5 p.m. and sunset. The average number of nights the men have in bed are nine in a month (?). 3. Regimental guards are mounted close to the barracks. Cantonment guards are very few in number and are 1½ miles off. The guards are taken for 24 consecutive hours. The roll is called at meal hours and at tattoo. During the day a check roll call is carried out as laid down in Circular dated 29 August 1855, Horse Guards. The night guards, being light, have not seemed in any way injurious to health. Strict attention is paid to the men's costume on guard. It varies according to the season of the year.
VIII. Instruction and Recreation.	1. The means of recreation and instruction are as follows. Two ball courts and skittle alleys are allowed to each regiment, and there are schools with schoolmasters properly trained and sent out. There is a splendid library and reading room at Trimulgherry, but it is at present occupied as a barrack. The 17th Lancers have a library and reading room, the accommodation of which is very insufficient, but will be improved. Complaints have been made of want of sufficient light at night. The Madras Artillery, the Royal Regiment at Trimulgherry, and the 18th Royal Irish Regiment have each soldiers' gardens. They are managed regimentally. There are no workshops. There is a theatre at the assembly, which is frequently at the disposal of the men, and nearly every regiment has a temporary theatre in one of their barrack rooms. There are gymnasia to the artillery and old infantry

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References to Subjects and Queries.	REPLIES.
VIII. Instruction and Recreation—*cont.*	barracks. These are not sufficient to keep all classes of men occupied. Workshops are much required, and encouragement should be given to men to practise the trades in which they have been brought up. The common class of men go out during the day in search of liquor. The habit might be much decreased by occupation in barracks. Except in the hot season, when men are prohibited going about in the extreme heat of the day, there is no restriction placed on the men quitting barracks by day when not on duty, but stringent orders are enforced as to dress being suited to the season and proper cover for the head from solar heat. (Remark by H. E. Com. Chief. See Colonel Cotton's proposal to provide every European regiment with a "recreation shed," annexed to my Report, February 1859. Nothing as yet done in the matter on account of the impoverished state of the public finances. (Signed) P. G.) 2. In addition to the recommendations given above the suggestion made by Colonel Cotton, commandant of Engineers, when at this station in 1859, to erect an extensive covering of sheet or cast iron under which soldiers might take exercise and practise different games at all hours of the day, and in any weather, is deserving of attention. 3. Savings banks have been long established by authority, and with the best effect. 4. There is not sufficient shade at this station, particularly at Trimulgherry, where trees are much required, nor are there any sheds for recreation. Every barrack is well provided with verandahs.
IX. MILITARY PRISONS.	1. The general military prison of Secunderabad is a new building, on the latest improved plan, unobjectionable as to ventilation, &c., and sanitary arrangements. The orders regarding discipline, diet, dress, &c., of the prisoners are strictly enforced.
X. FIELD SERVICE.	1. There are no local regulations for field medical service. 2. Recommendations made by medical officers in regard to marches, camping, &c., are generally attended to, but specific orders are often necessary to ensure the recommendations of medical officers being effectual, should it happen that commanding officers are unwilling to attend to them. 3. The practical working of medical recommendations for the preservation of the health of troops in camp consists in the senior medical officer at a station or in a camp being sanitary officer, and that not only on points of particular sanitary science, but also in regard to the general hygiène of the station or camp, his advice is to be taken and his recommendation attended to, if possible. It is advisable that the course laid down in the new medical regulations of Her Majesty's British service should be carried out in the Indian service, viz., that medical officers should be bound to offer hygiènic advice and suggestions, and commanding officers bound to state their reasons in writing if they see cause to reject such advice, for the information of higher authority. Commanding officers are directed to consult with the medical officers regarding the healthiness of the site upon which they propose encamping, and in such cases officers are to be guided by medical opinion, unless they see weighty reasons for setting it aside, which are to be at once reported to higher authority. 4. In the Madras Presidency there are no rules for field hospitals; the transport of the sick is carried on by closed doolies and six bearers, or open muncheels or litters and five bearers for the more severe cases, by sick carts carrying four men and drawn by four bullocks. There are no ambulances; transport of hospital supplies is by means of large field medicine chest carried by bearers or carts drawn by bullocks. (Remark by H. E. the Commander-in-Chief.—The question of organizing an ambulance department for the Madras Army, on a plan submitted by Dr. Duncan Macpherson, Inspector-General of Hospitals, is "*under consideration*," and has been so for the last two years. (Signed) P.G.)
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information.
XII. HOSPITALS.	1. Plans. 2. The Madras artillery hospital is 240 yards west of the barracks; the old infantry hospital 312 yards west of barracks; Trimulgherry hospital is 880 yards south of barracks; the native cavalry hospital 640 yards north-east of hutting lines; native infantry Hoossain Saugur lines, 1,370 yards north of ditto; native infantry Tarbund lines, 100 yards west of ditto; native infantry, Mahreddipilly lines, 490 yards S.W. of ditto; native infantry, Chillakulgoodum lines, 50 yards east of ditto. A reference to the plan of the station will show that the regiments are located at so great a distance from each other that the lines of each corps form, as it were, a separate cantonment of themselves. There is no civil population here other than the inhabitants of the general bazaar, which is miles distant from many of the hospitals. The distances from the bazaar are as follows:—

Madras artillery Hospital - - - -	1 mile N. of bazaar.
Old infantry ditto - - - - - -	140 yards W. of ditto.
Trimulgherry ditto - - - - - -	2 miles 170 yards N.E. of ditto.
Native cavalry ditto - - - - -	2 miles 1 furlong 160 yards N.W. of do.
(There is a bazaar, called the sudder bazaar, 100 yards S.W. of this hospital.)	
Native infantry Houssain Saugur lines - -	3 furlongs N. of bazaar.
Native infantry Tarbund lines - - -	1 mile 4 furlongs ditto.
Native infantry Mahreddipilly lines - -	2 furlongs 140 yards N.E. of ditto.
Native infantry Chillakulgoodum lines - -	5 furlongs 190 yards E. of ditto.

3. The water supply of the hospitals is abundant and wholesome.
4. In the European hospitals all impurities are removed daily, as from barracks. There are no drains other than surface drains, and no sewers. There are small cesspools attached to the privies of some of the native hospitals.
5. In the artillery hospital the lowest ward is raised 1 ft. 10 in. above the ground; in the old hospital 1 ft.; and in Trimulgherry 1 ft. 8 in. There is no perflation of air underneath. The roof water sinks into the soil. Wherever pipes are used, as is the case with Trimulgherry and old barrack hospitals, to convey the water from the roof, stone slabs are let into the ground to receive it, from which it runs off and is carried away by the slope of the ground. The hospitals are built of exactly the same materials as barracks. Neither roofs nor walls are double: both are sufficiently thick to keep the hospitals cool. The Trimulgherry hospital is an upper storied building; the rest are tiled, with the exception of the Madras artillery, which is a bomb proof and frightfully hot. It is, however, a condemned

References to Subjects and Queries.	Replies.

XII. Hospitals—*cont.*

building. All the hospitals have front and rear verandahs, and are sufficiently protected from the sun's rays. The condemned hospital above referred to is always covered with grass chuppers in the hot weather. The verandahs are never used for the accommodation of sick or convalescent. The hospitals are only one flat, except Trimulgherry, which is a two-storied building. The following table shows the hospital accommodation:—

Date of construction, Madras Artillery, 1828; Old Barracks, 1839; Trimulgherry, 1858.
Total number of wards, 10.
Total regulation number of beds, 775.

Wards or Hospital Huts.	Regulation No. of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.			Doors.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.	Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft. in.		Ft. in.	Ft. in.		Ft. in.	Ft. in.
Madras Artillery.														
Ward No. 1 -	17	71	18	14	17,892	1,052	75	1 11	4	4 0	3 0	10	7 1	4 0
„ 2 -	101	139	52	14	101,192	1,002	71	1 11	8	3 10	2 10	12	6 9	3 8
Old Barracks.														
Ward No. 1 -	25	65	18	22	25,740	1,029	46	1 11	- -	- -	- -	11	8 0	4 7½
„ 2 -	30	76	18	22	30,096	1,003	45	1 11	- -	- -	- -	15	8 0	4 7½
„ 3 -	43	110	18	22	43,560	1,013	46	1 11	- -	- -	- -	30	8 0	4 7½
„ 4 -	43	110	18	22	43,560	1,013	46	1 11	- -	- -	- -	15	8 0	4 7½
„ 5 -	30	76	18	22	30,096	1,003	45	1 11	- -	- -	- -	12	8 0	4 7½
Trimulgherry.														
Barracks No. 1 -	228	136	40	42	228,480	1,001	24	1 11	- -	- -	- -	29	10 7	5 1
„ 2 -	30	18	40	42	30,240	1,008	24	1 11	2	7 2	4 8	5	10 7	5 1
„ 3 -	228	136	40	42	228,480	1,001	24	1 11	15	7 2	4 8	15	10 7	5 1

All the hospitals are so placed as to receive the full benefit of the prevailing winds. The windows open in the same way as the barracks already described for doors. The arrangement is the best that can be desired for ventilation and coolness. Windows would be insufficient, and therefore doors are provided instead.

6. The ventilation is by the same means as in barracks. The jhilmil forms the outer door, the glass door the inner; all the recent hospitals have both. The jhilmils in the old infantry barracks hospital can be opened and shut at pleasure. Those supplied to the Trimulgherry hospital on the contrary are fixtures. By the jhilmils, as here referred to, is meant the flaps which pin at each end on a pivot into the framework of the door, not the door itself. The means of cooling are the same as in barracks.
8. The only means of warming is by shutting the doors and windows. The walls and ceilings are cleansed and lime-washed whenever they require it.
9. The Madras artillery hospital privy is situated at the north-west angle of the building, and connected with it by a covered passage. In the passage there are commodes for patients who cannot go outside, and there are tubs in the urinal. To the hospital of the old barracks there are three privies placed at three angles of the building, and connected with it by covered passages. There are no separate urinals; in each privy a urine tub is placed. The Trimulgherry hospital has four privies and four urinals, two to the lower and two to the upper story, and situated at the south-east and south-west angles of the building, and connected with it by covered passages. The urinals in the upper story are emptied by means of pipes which lead to the urinals in the lower story. All the privies are provided with screen-walls, wooden seats, and tubs with metal linings, which are removed from within. They are properly drained and supplied with water. Three of the hospital privies, viz., those of three of the native infantry regiments, have cesspools for the reception of filth; they are only offensive when opened. All have been recommended to be removed.
10. In the Madras artillery hospital a portion of the front verandah is enclosed as a washing place. It is not sufficient for the sick, and from its situation it keeps the front of the hospital damp and dirty. In the hospital of the old barracks there are four bath-rooms, one at each corner of the building; round each bath-room runs a ledge with gutters, on which the men place their basins while washing. The arrangements are sufficient for the sick. In the Trimulgherry hospital there is a bath-room on each floor stated to afford inadequate accommodation for the sick, some of whom are necessitated to wash in the back verandahs.
11. The means of bathing are the same for all the hospitals, by a supply of bathing tubs; they are amply sufficient and convenient.
12. The washing of hospital linen is by dhobies, and is quite sufficient.
13. The storage is sufficient and dry.
14. Some of the cots supplied to hospitals are of iron, others are of wood; a frame on which broad-tape is bound, to form the bottom of the bed.
15. The cook-room of the Madras artillery hospital is a small outhouse in the north-east corner of the enclosure, to the lee side of the prevailing winds. The cook-room of the old barracks hospital is in the centre of the rear of the enclosure, at a convenient distance from the wards. At the Trimulgherry hospital the cook-room is to the south and back of the sick-wards, and at a convenient distance. In all the means and apparatus for cooking diets are the same, viz., the usual copper tinned utensils, frying pans, earthen pots, &c.; they are amply sufficient. The cooking is satisfactorily done, and can be varied as occasion requires.
16. The diet tables, diet rolls, &c., are too voluminous to enter here. It is suggested that a copy of the Madras Medical Code, which contains all the regulations, forms of returns, and reports, &c., now in force, be sent to the Royal Sanitary Commission.
17. As attendants on the sick a hospital serjeant is appointed for each regiment, a nurse with a salary for the female wards; a comrade is allowed as orderly to attend on very sick men, and native female attendants are provided for the women's ward, and male ones for the men's, in ample numbers.

SECUNDERABAD. MADRAS.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	18. The sanitary condition of the hospitals of this station is generally good, with one exception; that of most is very excellent. The old artillery hospital is small, ill ventilated, and on a bad plan, but it has been condemned, and a new one will be erected when other great works now going on will permit. The old European infantry hospital (now cavalry), partakes of the objectionable character as to site of the adjoining barracks, but it is on higher ground, and further away from the line of drainage and from the rocks, and is, in itself, in good sanitary condition. The exception alluded to above is the hospital of the native infantry regiment occupying the lines on the tank; it is far from the Sepoy lines, situated on the cantonment side of the Secunderabad bazaar; hospital gangrene frequently occurs in it, attributable to its being overcrowded, owing to the number of sick, to the cachectic condition of many of the men, owing to the unhealthy character of the site of their lines, and to the existence of an offensive cesspool within the small confined hospital enclosure. This latter defect is, at the present date, 1860, being effectually remedied. N.B. One European infantry regiment, (18th Royal Irish), having lately been added to the strength of the force, is accommodated in temporary barracks and hospital, on the whole, of very good character, while permanent buildings are being erected. 19. There do not appear to be any other notable deficiencies and defects than those named under the foregoing heads. 20. As a general rule there are no "convalescents"; those who are unfit for duty remain in hospital till effective, and then return to duty, (recommended by the surgeon, when he thinks it advisable, to be light), and to barrack rations. Exercise is taken by men in hospital who are convalescent, in sick-carts and doolies. There is no suitable fenced ground, shaded walks or seats, which are much needed. The old infantry hospital is the only one possessing them in any degree, and the enclosure has lately been much improved in these respects. 21. At every European hospital there is a separate building assigned for the reception of sick women and children. The arrangements are satisfactory, but out-offices are required for the women's ward of the Trimulgherry hospital. 22. There are no local medical regulations. 23. The suggestions and requisitions of the medical officer in all matters regarding his hospital receive every possible attention. 24. There is no accommodation for convalescents, and it is very much needed at this station. There are at all times, but especially when dysentery and hepatitis are most prevalent, a number of weakly men, who would be greatly the better for a place to receive them intermediate between the hospital and the barrack room, where diet and regimen would be under the direction of the surgeon, and more liberty might be allowed than is compatible with the discipline required for sick under treatment.
XIII. BURIAL OF THE DEAD.	1. There are four burial grounds used by the British troops, all within the station. The great burial ground is in the very centre of the cantonment; there is also one near the old barracks, one at Trimulgherry, and one near the temporary barracks occupied by the Royal Irish regiment; all of these are well selected with reference to the prevailing winds, with the exception of the one in the centre of cantonments. 2. The great burial ground is 345 yards by 90 yards; the old barrack do., 204 yards square; Trimulgherry do., 151 by 147 yards; Bohenpilly do., 130 yards square. Soil, granite debris with vegetable mould; subsoil, decomposed granite. Drainage, good in all. Decomposition takes place readily. The Protestant portions well kept, not so the Roman Catholic, which is not provided with the same means. 3. The following are the grave spaces:—Length, 7 feet; breadth, 3½ feet; depth, 6 feet; interval between graves, 3 feet. Graves are never reopened. Interment always takes place 12 hours after death. The depth of the graves of natives is, say, 3 feet for men, and 3½ feet for women. There is no prescribed interval for them between graves. Graves are never re-opened, nor more than one body placed in each. Interment always takes place within 12 hours after death. 4. During the recent extraordinary hot season, complaints were made that the great burial ground was offensive at night. The following remedial measures were suggested by the deputy inspector general of hospitals and supplied:—Coarsely pulverized charcoal and lime in equal quantities strewn over, and dug a few inches into the soil of all recent graves, and fissures produced by the intense heat, filled up also with lime and charcoal. It was subsequently ascertained that the exhalations were caused by the extreme dryness of the earth, causing the mould, when a grave was dug, to break into large clods, and these when the grave was filled in, left interstices through which the fœtid gas permeated. The clods were then broken up and pulverized previous to an interment taking place; the rain, however, shortly set in, and abating the heat, removed all cause of further complaint. 5. The dead of the camp-followers and bazaar people are either burned or buried at the places established for that purpose. 6, 7. No nuisance whatever arises from the present practice, and no improvements are required.

(Signed) E. APTHORP, Brigadier,
Commanding Hyderabad Subsidiary Force.
ROBT. COLE, Deputy Inspector General of Hospitals.
FRANCIS HASTINGS COBBE, Captain.
Executive Engineers.

1st December 1860.

TRICHONOPOLY.

HEAD QUARTERS, SOUTHERN DIVISION.

Accommodation - European Troops - Artillery - - - 148
Infantry - - - 947
Native Troops - Cavalry - - - 387
Infantry - - - 2,583

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The general aspect of the surrounding country presents the following features:—To the north it is rather confined by the town and suburbs of Trichinopoly; this town is built on the right bank of the river Cauvery, running from west to east, 2½ miles from the present cantonment, between which and the town there is much rice and other cultivation, plantain topes, &c.: the soil is a rich alluvial deposit, which gradually assumes a sterile and sandy appearance near the cantonment. To the south the country is open, sterile, rocky, and slightly elevated. On a sloping space, between the town and the above elevated ground, the cantonment is situated, somewhat advanced from its former position at Worriore. The Pootoor lines, and a considerable stream or canal, and a remnant of the old cantonment, form the natural boundary of the west side of the station. To the east and west the country is tolerably open, and dotted here and there with villages, patches of rice cultivation, mangoe, and other topes, more particularly on the western side. The ground around the station is uniformly flat. There are mountains in the north-west and to the south. There are no swamps near, or much water, except where the Cauvery overflows in the monsoon and the rice fields are under water. The banks of the Cauvery river are for miles covered with the most luxuriant vegetation, which space, as well as the land lying to the west of the station, is for a short time during the periodical rains under water, caused by the overflowing of the canal above alluded to. The roads east and west are lined with trees, and there are many topes or clumps of trees in the vicinity of the river. There is a small tank or swamp to the south-west of the cantonment in rear of the butts. 2. The elevation of the town above the sea is 250 feet. With the exception of the country to the east and west, the cantonment occupies an elevation superior to that of the country adjacent. The nearest water is the canal forming the western boundary, which supplies numerous tanks. There is no healthier ground adjoining the station. The Pulney hills near Madura are doubtless healthier, but are far to the south-west of this. The Calley Malay hills, some 20 miles or more distant, are highly the reverse of healthy. Two Roman Catholic priests two years ago went and spent a day and a night in these hills. One was destroyed almost immediately by severe low fever; the other was brought to Trichinopoly, where his life was for some time in imminent danger. 3. The nearest mountains are some 20 or 30 miles distant, and some 2,000 or 3,000 feet high. 4. The canal from the Cauvery, which is the nearest water, passes through the station at the lowest part, near Pootoor. The river overflows the ground to the east and west for some weeks about November. The nullah also overflows and covers the ground immediately in the rear of the artillery barracks, south-west of the station. The fort ditch enclosing the town of Trichinopoly, 2½ miles from the station, is the worst broken ground in the neighbourhood, and its effect on the health of those near it must be injurious, as it is the receptacle for all filth; it is, however, usually dry, except during the rains. There is also a tank to the north-east of the station, which, when drying up in the arid months, is supposed to breed malaria. 5. The station is open and freely exposed to winds. The temperature of the station is raised in parts by reflected sun heat, where the houses are close to each other, and in the European barrack and hospital squares. The station is exposed to hot land winds during the months of April, May, and June: and to cold north-east winds during the monsoon, when colds, accompanied by slight fever, are prevalent. 6. The surrounding country is cultivated generally near the banks of the river Cauvery, and more inland at some distance from the station. There are large Government works of irrigation near the station conveying water to the fields north, east, and west of the town, and the works of Annicut 15 miles distant. Artificial irrigation has generally no injurious effect on the health of the station. The cultivation of rice is not restricted within certain limits. There is no cultivation of hemp or flax in these parts, nor any injury to health from the cultivation of indigo, which is grown at some distance from the station. 7. The town of Trichinopoly, adjoining the station, is surrounded by the villages of Worriore, Teunore, Pootoor, &c., all within from 1 to 2½ miles of the station. 8. The geological formation of Trichinopoly is volcanic, that is, composed chiefly of granitic rock of different kinds, several of which are seen round the station, as the high Fort Rock, the Fakeer's, and Golden rocks, chiefly composed of that species of granite called Syenite, unstratified and of mamillary forms, having evidently undergone fusion, and in that state projected from below by volcanic force, and some stratified rocks thus displaced are here and there seen also, likewise some trap rock; but the sterile ground to the south is wholly granitic, in various stages of decomposition, giving a red sandy soil on the surface, but hard rock below. Along the valley of the Cauvery the soil is a deep rich alluvial deposit, but the high ground near the station is composed of broken granite, nodules of Kunkur (carbonate of lime) and laterite; also seen on the heights are iron ores. 9. The depth below the surface at which water is usually found is, during the dry season, from 25 to 30 feet, and from 5 to 15 feet during the rainy season. 10. The rain flows readily away, with the exception of the brigade ground, the surface of which is more elevated than the station, and the drainage from which passes into the subsoil and over the surface of the station. 11. The water supply of the station is derived chiefly from wells, every one of which is more or less impregnated with lime received during its percolation through the earth. The water is partly stored in open tanks; the one at General Bishop's house at Pootoor and those in the fort and town are of considerable size, but the supply for the troops is generally from wells. There are but few tanks in the station, and those small but generally full; some of them contain fish, water lilies, lotus, &c. Natives bathe in some tanks, the water of which

TRICHINOPOLY. MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	is used for drinking, as in the tanks in the town. The wells are nearly all in private gardens; the quality of the water differs very much at points very near one another. There is no nuisance from the tanks with the exception of the one to the north-east of the station, which, when drying up, is unhealthy to those living in its vicinity. 12. The water supply for the station is abundant, the smell and colour good and clear; but most wells are slightly brackish in taste, some few are perfectly sweet. The tank water is neither so clear nor so good. The well water is hard and contains carbonate of lime, which is partially removed by boiling; it is not found injurious to health, except to those subject to oxaluria. There is little or no lime in the river water. In private dwellings the water is raised by wheel, rope, and bucket, worked by hand. It is distributed to the troops conveyed on bullocks in puckals or leather bags. No doubt the river water, if filtered, would be better. The brackish well water is used only for culinary and bathing purposes. 13. Sanitary improvements, such as levelling ruined houses, now receptacles of filth and detrimental to health, repairing of enclosures, &c., cannot be carried out for want of legal powers, and from the proprietors disregarding repeated applications from the military authorities and the recommendations of the station sanitary officer. This want of legal control is in consequence of the ground being held on civil lease. 14. The sites of new stations are selected by committees of experienced officers, of which committee the senior medical officer is usually a member. Height is generally held as an important condition, and also distance from malarious swamps, and being out of the course of winds blowing over them. A healthy state of the native inhabitants of the district is also a condition, viz., that fever, cholera, or any other disease does not usually prevail among them. Cotton ground (regur) is found to be injurious, producing fever, and is avoided. I would suggest that these committees should be composed chiefly of experienced medical officers, instead of having one medical member, who may be, and often is, overruled by the military portion.
II. CLIMATE.	1, 2. There are few meteorological instruments available at the station, none are good, except an aneroid barometer, and some Fahrenheit's thermometers, and rain gauges. The tables at the station are too imperfect to be worth transmitting. 3. The climate is for two-thirds or three-fourths of the year hot. The mean annual temperature is about 85°. The greatest heat in the shade being a few degrees above 100° Faht., and in the sun many degrees higher (140°). The mean annual fall of rain is about 30 inches. The winds from October to May are generally from the east and north, but vary; the rest of the year generally from the opposite direction, W., S.W. and S. There is generally much glare and radiation of heat, a dry and sultry atmosphere often for months together. Whirlwinds, accompanied by clouds of dust and sand, recur at short intervals in May, June, and July. The rivers and tanks become dried up, and vegetation is completely suspended. The climate is enervating, impairing the digestive organs, and rendering light diet, with but little animal food, necessary. For three months woollen clothing is required, and light cotton clothing during the rest of the year. The weather does not admit of the troops being exercised much during April, May, and June, and then only in the early hours of the day. These months and July are the most unhealthy, and cholera and fever prevail during them. November, December, and January are the most healthy months. 4. The Pulney hills are at about 80 miles; the Shevaroy hills at about the same distance; the Neilgherries at about 145 miles, all within the division, are well watered by natural springs, and the climate is invigorating and salubrious. The greatest height is 7,000 to 8,000 feet. It is a received opinion that a lengthened residence of troops in these hills would render them unfit for work in the plains; but that they are excellent as a sanitarium. 5. The Deputy Inspector-General of Hospitals states that the period of his service is 30½ years, during 26 years of which he has been constantly in India, and has served in all divisions of the Madras army, including Burmah, and nearly two years on field service in 1857, 1858, 1859, in Central India, at the stations of Madras, Bangalore, Secunderabad, Ellore, Saugor, Rangoon, Tonghoo, and two years in the mountains of Goomsur. The difference in the comparative healthiness of the stations is much less than is generally supposed. The cause of the insalubrity of Secunderabad, generally attributed to barracks, seems to be still misunderstood. A temporary locality should there be selected, slight temporary barracks run up, and changed from time to time, till a healthy site was found.
III. SANITARY CONDITION OF STATION.	1, 2, 3. A map of the station and adjacent country, and a plan of the station itself, together with a ground plan, are forwarded. 4. Table of Barrack Accommodation.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Height of Men's Beds above the Floor.	Windows.			Remarks.
		Length.	Breadth.	Height.	Cubic Contents in Feet.		Number.	Height.	Width.	
European Infantry Barracks.		Ft.	Ft.	Ft. in.	Ft.			Ft. in.	Ft. in.	
Do. do. Tiled -		1,011	18	17	309,366	1½ ft.	110	5 0	3 6	
Do. do. Bomb proof		795½	16	9 7½	99,118	,,	83	5 0	3 6	
Do. (5) Temporary		160	25	23⅛	92,500	,,	14	4 0	3 0	Built in 1858.
					500,984		207			
Guard Room - -		66¼	16	9 7½	8,085	,,	6	5 0	3 6	In the bomb proof.
Do. - - -		37	17	16 3	10,211	—	8	6 0	4 0	Built near the temporary barracks, at present not used as a Guard Room.
					19,296		14			

Table of Barrack Accommodation—*cont.*

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
European Infantry Barracks—cont.		Ft.	Ft.	Ft. in.	Ft.			Ft. in.	F 6	
2 Prison Cells - -		17½	16	9 1½	5,110	—	3	5 0	3 0	In the bomb proof.
10 Solitary Cells - -		8	8	11 9	752	—	3*	1 3	6 3	* Ventilators.
Guard Room for do. -		14	10	13 6	1,890	—	2	4 6	3	Completed in 1859.
					7,752		8			
Artillery Barracks.										
Centre Rooms (2) -		39½	23½	28½	26,223	1½ ft.	6*	9 3	5 0	
Enclosed Verandah -		247	12¾	17¾	55,899	„	14*	9 3	5 0	* Doors.
New Hall - - -		42	41¼	21¾	38,682	„	4*	6 9	5 0	Completed in 1860.
					120,804		24*			
Guard Room - -	{	36	15	15⅛	7,260	„	6	3 0	2 0	Ventilators.
	{	—	—	—	—	—	7	3 9	3 0	
Prison Cells (1) - -		25	15	16¾	6,125	—	3	3 0	2 6	
Do. (2) - -		15	12	12¼	2,205	—	8	1 4½	3 6	Ventilators.
					8,330		11			
1st Regiment L.C. Guard Room -		20	20	12¾	5,100	—	3	4 0	3 0	
13th Regiment N.I. Guard Room -		27¼	22	12¾	7,605	—	None	—	—	
15th Regiment N.I. Guard Room -		27¼	22	12¾	7,605	—	None	—	—	
Prison Cells (1) - -		8	8	11¼	720	—	4	1 3	6 0	Ventilators.
39th Regiment N.I. Guard Room -		30	14	14¾	6,195	—	4	4 6	3 6	
Prison Cells (1) - -	{	16¼	15	11½	2,803	—	1	4 0	3 0	
	{	—	—	—	—	—	1	1 3	3 0	Ventilators.
Native Solitary Cells -		8	8	11	704	—	2	3 0	2 6	
Do. Grd. Room for do.		18	14	13½	3,402	—	3	4 0	3 0	

(*Note.*—The return does not show the number of men allotted to each barrack room, and the cubic space and superficial area per man cannot be ascertained from it. The total aggregate cubic space of the infantry barracks would allow only about 530 cubic feet per man for 947 men, and the aggregate cubic contents of the artillery barracks, including the verandahs and hall, would give about 816 cubic feet per man for 148 men.)

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides of the barracks; they are fitted with iron upright bars and wooden crosspieces, and open inwards. The barracks of the artillery are furnished with folding venetian doors and glass windows all round the old portion enclosed. There is a verandah on one side only, running round the whole of the inner side of the barrack square. Its breadth is eight feet at the bomb proof, and 10 elsewhere. The artillery barrack has an enclosed verandah round one portion 12½ feet wide, a verandah, 12 feet wide, on either side of the new and central portion, and no verandah to the remainder. The verandahs are not usually occupied to sleep in, although in hot weather the men sometimes move their cots into them. They are never used by other persons as sleeping quarters. The enclosed verandahs of the artillery barracks are occupied as sleeping quarters by the men. There are no regular venetians. The windows are closed by wooden shutters or planks, which are fastened by buttons on the centre wooden upright. All the doors in the old portion of the artillery barracks are jhilmils; in the new portion there are glazed windows. 6. The cots are composed of three planks each, 1 ft. broad by 6 ft. 6 in. long, supported on tressels. The bedding consists of two cotton sheets 8 ft. by 4½ ft.; a Europe blanket 7 ft. by 6 ft.; a carpet 6 ft. by 3 ft.; and a quilt 7 ft. 4 in. by 4 ft. 4 in., and stuffed with cotton. The men are furnished annually with one sheet, one quilt, and a Europe blanket every two years. In tents, on the line of march, in damp or wet weather, straw is laid on the ground for them to spread their bedding on. 7. The European tent is rectangular, 21 ft. long, 15 ft. wide, 10 feet high in the centre; the height of the walls is 5 feet. The cubic space is 2,100 feet. There are two flys, and one set of walls. There are three cloths in each when made of Vizagapatam cloth, and four in each, when of other inferior cloth. The tent has two doors, each of which can be closed or opened at pleasure; when open, the portion of the wall lifted, forms a shade for the entrance. The ropes are of country cotton, and the poles of bamboo. The tent is to contain 25 men, each man having cubic space of 84 feet, and a superficial space of 12 ft. 6 in. The native tent is conical, with an elliptic base 22 ft. by 12 ft. diameter; height of pole 9 ft.; the cubic contents are 1,866 cubic ft., and the superficial area 264 ft. They are to contain 25 men, each man having a superficial space of 10·56 ft., and a cubic space of 74·64 ft. The tents have only one fly, the materials of which are the same as those for the Europeans. They have one door, which closes round the bottom, and a curtain 1 ft. 9 in. in height. 8. The bomb proofs have no particular means of ventilation beyond the windows and doors. The barracks and guard rooms that have been altered, are ventilated by the ridge having been raised two feet, leaving an open space running their whole length. In the old barrack room of the artillery, the ventilation is by the doors. In the new barracks, there are six ventilators 6 ft. by 2 ft., and six oval ones round the top of the room. The ventilation in the old barrack room, and the bomb-proof part of the barracks, is insufficient; but where the roof has been recently constructed, it is so, as regards those of the European infantry. The air of the barrack rooms is kept cool by Punkahs, and also by Kuskus tatties, placed against

Trichinopoly. Madras.	References to Subjects and Queries.	Replies.
	III. Sanitary Condition of Station—*cont.*	every alternate window and door, kept wet by coolies. These tatties are furnished by commissariat arrangement. 9, 10, 11. The artillery barracks are built of brick and chunam with flat roof. Those of European infantry, with tile roofs and ridge ventilators, with the exception of one-third, which is bomb-proof. The tents are composed of Vizagapatam cloth, as before stated. Huts are built by the Sepoys of mud or sun-burnt brick, with tiled or thatched roofs. The barrack floors are granite, raised from 6 in. to 2 ft. from the ground, and chipped. There is no passage of air beneath. The materials and construction are generally suitable for the climate. The artillery barracks might be improved by adding a verandah all round. The barracks are kept in repair by the executive engineer under the orders of the commanding officer. The repairs are not quickly executed. The military authorities are responsible for the sanitary state of the cantonment. The walls and ceilings of barracks are cleansed and lime-washed once every year, and oftener, if urgently required. 12. All the barracks are supplied with washing tubs (4 to a company), which are kept in the verandah and filled by the puckallies. There are two wash-houses supplied with water from wells, one is drained by an open channel round the square, and the other by an open channel running into an open drain which joins the main drain. The artillery barracks are unprovided with lavatories, although lately applied for, but they have a plunge bath 44½ feet by 19·8, and 10 feet deep, filled from an adjacent well and drained into the paddy fields in the rear of the barracks. 13. The cooking is provided for by the employment of 8 native cooks per company, who are paid by the men at the rate of 6 annas per man per month. A drain runs through the middle of the cook-house and under and across the barrack square, and joins the others. The artillery barracks have one cook-house attached, 38¾ by 15½ feet, with ridge ventilators. They are supplied from an adjacent well by puckallies, but have no regular drain for carrying off water, &c. The linen of each company is washed by native washermen in the river, and dried on the banks. The conveniences are sufficient for the wants of the station. 14. No drainage is required for the privies; the contents are carried away in carts every morning and deposited in pits at some distance from the station, the soil being occasionally covered with loose earth. The privies are provided with earthen chatties. 15. The new cook-houses are ventilated in the same manner as the barracks; the new privies by a space being left between the top of the side walls and the roof; they are lighted by lamps at night. 16. An open drain, about a foot every way, runs completely round three sides of the barracks, and along the fourth a deeper one about 1½ feet wide, which joins the others, where they run under ground and find an outlet into a large open ditch which runs into the nullah at Pootoor bridge. The outlet is about 50 yards from the nearest temporary barracks, but about 200 yards from the permanent barrack square. This drain carries off the water from the lavatory in the barrack square. The temporary barracks are drained by an open drain running along by the side of them and connected with the smaller drains round the barracks themselves. The artillery barracks are not drained. The drainage is sufficient for carrying away the surface water, &c. The barracks, with the exception of the serjeant-major's quarters, are generally dry and healthy. Eight houses in the European lines are, as compared with others, the focus of disease, as fevers and cholera therein are very violent, and two cases recently did not appear amenable to treatment till removed from the locality. The artillery barracks are not damp, being raised two feet from the ground. The refuse fluid from the artillery barracks drains off from the natural slope of the barracks into the surrounding fields, which are 3 feet lower, or sinks into the subsoil. There are no cesspits. The old ditch of the fort, 2½ miles from the station, is extremely foul. 17. The surface cleansing of the cantonment is good; it is efficiently done by scavengers' carts, the refuse, &c. being taken away daily. The horse dung of the cavalry is burnt. 18. The surface of the cantonment is generally kept free from vegetation, but there is some within the limit. There are numbers of old walls, thick hedges, &c., interfering with the ventilation of the station, &c., in the environs. There are several ruined houses before alluded to. 19. The drainage of the bazaar is good, ventilation defective. The water supply is bad, scanty and generally brackish. The bazaar is usually clean; there are latrines (open cesspits.) It is a mistake having them in this country, and an intolerable nuisance when the wind blows over them. In the general bazaar each house owner is required to keep the road and drain in front of his house clean with the help of the scavengers' carts allowed by Government. The bazaars are kept in decent order. There are several parts of the cantonment which would be improved by pulling down the walls of the unoccupied and deserted huts, filling up the pits, and levelling the ground. The native houses near the station, are very ruinous and not ventilated. There are no dung-heaps or cess pits within them. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Cattle are slaughtered for the troops near the regimental bazaar. The regulations for the slaughter places are, that they shall be inspected at least twice a week, and the channels sprinkled with lime. The offal, &c., is sold to the ryots and others; nothing is left undisposed of. No complaint has been made of any offensive smell arising from the condition of the slaughter places. 21. With regard to the arrangements for stabling or picketing the bazaar cattle and those of the camp followers generally;—each house owner keeps his cattle in his house or courtyard adjoining it. A scavenger removes the sweepings of each house every morning, and deposits them in the outskirts at some distance from the station. 22. There are no stables for the artillery horses; they are picketed outside the barrack square about 100 yards from the barracks; no dung heaps are allowed to accumulate, the manure being made into bratties. The picketing grounds for both cavalry and artillery are convenient for the men; that of the cavalry is near their hospital, the artillery at half a mile or more from their hospital. The horses are picketed in parallel lines on clear, open, well drained ground. 23. There is no separate building for married men's quarters; a portion of the barracks has been given over for the soldiers' families, and there is sufficient room for them, as the strength of the regiment now stands. The artillery non-commissioned married officers have good quarters. The men live in huts of an inferior description built of mud, thatched, in the patchery, adjoining the barracks. None of the married people occupy barrack rooms with the single men.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.* *Officers' Quarters.*	1. The officers' houses, at least the greater portion of them, are in very bad repair, the roofs harbouring vermin; they are badly built of the worst materials; sun-dried bricks, porous tiles, and green wood. Few, if any, resist heavy rain; they generally leak very much; they are hot and low roofed, and much crowded. Large numbers of these houses belong to the same proprietor, and as the tenant is without remedy, it is difficult to get the slightest necessary repairs executed by the landlord; they are insufficient in number, and far inferior to officers' houses in most cantonments, and the rents are exorbitant. House owners should be amenable to house boards as at other stations.
IV. Health of the Troops.	1. The station and district are healthy, as also are the native population. 2. The chief diseases are bowel complaints and fevers. 3. The healthiness of the native population is to be attributed to the simple and unstimulating nature of the mode of living. 4. The regiment was stationed at Burmah before coming to this station for two years and two months, and on quitting Burmah in April 1858, was in good health. Diseases of the bowels and fevers were more prevalent during the monsoons, and showed 602 admissions in 26 months' residence there. Left wing arrived at Trichinopoly on 29th December 1857, and the right wing 27th April 1858, in good health. The prevalent diseases since arriving have been diseases of the stomach and bowels, fever of various types, and venereal disease. The artillery barracks are adjoined on one side by paddy fields, and on another by the Wycondah channel, which is dried up part of the year; these barracks are consequently more unhealthy than those occupied by the European infantry. 5. Troops are never camped out. 6. As to hill stations, there is no fact better established than that acclimation is preventive of disease in this country. 7, 8. It was particularly observed by the Deputy Inspector-General during the severe campaigns in Central India, that old acclimated soldiers did not suffer half so much as Queen's troops recently arrived; it therefore appears desirable that troops, only as they become feeble and appear to suffer from the heat of the low lands, should be sent to sanitaria on the hills, and on becoming robust, should resume their duties on the plains. Hill stations are in this way of great value, not as permanent residences. In short, the service should be in the plains, with occasional resort to the hills. 9. All organic and inflammatory diseases are increased by removal to the hills. Mere weakness, however caused, chiefly benefited. 10. The precautions necessary to guard the men at hill stations are good diet and warm clothing. It is particularly necessary to avoid overcrowding the barracks. 11. 12. The latter part of the cold and the whole of the hot season are best adapted for residence in hill stations. The shortest period of residence to obtain the full benefit of such change is twelve months. Too long a residence would render troops unfit for duty on the plains. 13. The special precautions required on leaving hill stations are not to throw off warm clothing too soon, and to avoid exposure to the sun. 14. Service in the plains, with short periods of change to hill stations, has been found by experience to be most conducive to the health of the troops in India. Frequent change of station is decidedly beneficial. 15. No sufficient information as to the barrack and hospital accommodation at hill stations. 16. The most suitable elevation for hill stations in this latitude would appear to be 6,000 feet. 17. There is no higher ground near the station which could be advantageously occupied as a hill station better than the Neilgherries, distant 160 miles; the road is pretty good and would admit of troops being sent up in bullock transits; the expense is the chief obstacle. The hills are 7,000 feet high, the climate is inferior to that of the Australian colonies. A sanitarium is already established there for European troops at Wellington, near Coonoor. 18. Regur or black cotton ground, which consists of decomposed trap, is decidedly productive of fever; this was seen all over Bundlecund, where it prevails. 19. The best age for soldiers proceeding to India is between 22 and 25 years. The best period for landing in India would depend on which coast troops are landed, and whether any march would have to be made inland after reaching India; the best time is usually considered to be the end of the hot season, by which they would be gradually introduced to the next hot weather. On first landing the men for the infantry are sent to the European infantry depôt at Arcot, where there are barracks for their accommodation. Clothing is issued to them agreeably to regulations, and they are then instructed in their drill and duty till ordered off to join their regiments. The precautions for preserving the health of troops on arriving in India are,—avoidance of a too sudden alteration from ship rations to fresh rations and excess in the supply of vegetables. Restriction to barracks from 8 a.m. to 5 or 6 p.m.; light drills, loose clothing, woollen clothing at night upon duty and during the rains, &c. Diminished sun glare in barracks. 20. Troops should be sent direct from the home depôt to India, for the sooner the men fall into the Oriental mode of life and habits the better. Life on the hills gives no insight into that of the plains, nor would residence there acclimatize men for life and work in the latter. On arrival the regiment should be sent to a station and there left for five years, camping the men annually, in the cold season, in the neighbourhood of the station, for three or four weeks, ground being frequently broken. This would overcome the dulness of barrack life, &c. No extra expense need be incurred. The barrack and other establishments to be engaged should stipulate to accompany the regiment on such excursions free of batta. 21. Short marches early in the morning is the usual and best mode of transport of troops from the port to the interior. 22. The number of years a British soldier should serve in India is 15. 23. The mode of conducting medical invaliding committees is very free from objection. 24. The time of departure of invalids from India for home depends from which coast they depart, and by what route they proceed. They should be sent to England at the beginning of the summer.
Diseases.	1. There are regular inspection parades weekly for the discovery of incipient diseases. 2. There is no scorbutus among the troops. 3. The cause of hepatic disease is often the high temperature, and more frequently the use of spirituous drinks (hydrocarbons), but all scrofulous habits are predisposed to inflamed and enlarged liver in India. This has been abundantly seen. Those who in England would

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	be phthisical will get abscess of the liver in India; such men should be sent to a hill station and avoid drink. The proportion of hepatic disease is 1 to 34 of other diseases. The causes of it are exposure to the sun, drink, damp, and sudden reductions in temperature. It is frequently found connected with dysentery, and occasionally supervenes after a well-cured case. Avoidance of the above causes would prevent its frequency. 4. Dracunculus is very rare among Europeans. 5. The proportion of venereal disease to the total sick is one-fourth to one-fifth, and the average period that men are away from duty is 20 days. The remedy is marriage, with an allowance to the wife during widowhood and to each child. Lock hospitals are of little use, as they frequently become instruments of tyranny or revenge. The disease is communicable long before the sufferer is aware of its existence. In a European corps of between 600 and 700 strong there were, during the year, nearly half that number of venereal diseases. Lock hospitals might be rendered of great value, that is, if all the women of the town were often examined at their huts by an experienced nurse, and diseased ones brought into hospital. 6. The troops suffer from fever and dysentery. Intermittent fever is the type most common. *Cholera* comes in with the north-east wind, almost every year attacking natives more than Europeans. *Small Pox* chiefly prevails in the hot weather. *Rheumatism* is not prevalent, owing to the very equal temperature. No knowledge of the proportion which admissions and deaths from these diseases bear to the total. Information can be had of the Principal Inspector-General of Hospitals. 7. *Itch and Leprosy*, amongst natives, are the more frequent diseases. They prevail all the year round. The sanitary condition of the native houses is bad, and very favourable for the propagation of skin diseases. The predisposing cause of these diseases is the want of ablution generally. 8. The most fertile source of disease amongst soldiers is bad spirituous liquors, not obtained in the canteen. 9, 10. Quinine has not been tried at the station as a prophylactic against malarial diseases. No recommendation to make for the prevention or mitigation of epidemic diseases at the station.
V. Intemperance.	1. The soldiers at the station are usually temperate. In the artillery, from six to eight per cent. of the men undergo confinement during the month for drunkenness. There are only five confirmed drunkards in the regiment. None at present in the artillery. 2. The proportion of admissions into hospital from intemperance is— Directly, 70 - Indirectly, 41 - Total admissions, 111. Diseases caused directly and indirectly from intemperance show 12¼ per cent. to total admissions for all diseases during the past 11 months.

Table showing the effects of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime from 1st April 1859 to 29th February 1860, being 11 months.

Diseases.	Non-Commissioned Officers, Privates, and Musicians.								Awarded Punishment by	Non-Commissioned Officers, Privates, and Musicians.		
	Teetotallers.		Temperate.		Intemperate.		Total.					
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.		Teetotallers.	Temperate.	Intemperate.
Fevers	2	—	203	—	6	—	211	—	Regimental Captain	—	69	1
Cholera	—	—	5	—	—	—	5	—				
Dysentery, Acute, Chronic	—	—	25	3	—	—	25	3	Commanding Officer	—	570	120
Diarrhœa	—	—	22	—	—	—	22	—				
Other Diseases of stomach and bowels	2	—	93	—	5	—	100	—	Regimental Courts-martial	—	10	6
Hepatitis, Acute, Chronic	2	—	24	—	—	—	26	—				
Disease of the Lungs	1	—	29	—	1	—	31	—	District ditto.	—	4	1
„ „ Brain	1	—	29	1	17	—	47	1				
Rheumatic Affections	—	—	29	—	—	—	29	—	General ditto	—	1	—
Venereal	—	—	144	—	3	—	147	—				
Dropsies	—	—	1	—	—	—	1	—				
All other Diseases	3	—	237	—	16	—	256	—				
Total	11	—	841	4	48	—	900	4	Total	—	654	128

N.B.—The heading temperate includes only men who have not been brought to court-martial for drunkenness.

Drunkenness is always punished as an offence.

3. Distilled spirits are sold both at the canteen and the bazaar. The spirits sold in the canteen are of the best quality; the amount consumed is less than one dram each man per diem; that sold in the bazaar is execrable; spirits are not issued as a portion of the soldier's ration, but the men are allowed to draw two drams of arrack per diem from the canteen on payment. None is issued before half past one o'clock p.m. The same remarks apply on the march and in the field. The quality is the best, and never exceeds two drams per day. The men are not in the habit of taking a dram before morning parade. Spirit is never given as a ration to convalescents. Ginger beer is the only other drink sold in the canteen.
4. Consumption of spirit is injurious to health and detrimental both to the efficiency and discipline of the corps.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	5. It would be decidedly advantageous to health to abolish spirituous liquors as part of rations, where supplied as such, and their sale in the canteen and bazaars. No spirits should be permitted to be sold within a circle of 10 miles of barracks. 6. Spirits act as an irritant poison and wine and malt liquors act as cordials, and uniformly benefit the digestive functions unless any idiosyncrasy be present. 7, 8. Tea and coffee only are much used at the station, and about 10 dozen of ginger beer daily in the Artillery Company. Tea, coffee, &c., are infinitely more advantageous to health than malt liquors, and their substitution would be highly beneficial. 9, 10. It would be beneficial to abolish spirituous liquors in toto. I know no more baneful compound than that sold in the bazaars as arrack; for this any drink might be substituted with advantage. I would restrict the sale of it, and give every inducement to the men to take malt liquors in preference. 11. The canteen and bazaar regulations are, according to the G.O.C.C., 17 August 1855. The canteen regulations are obeyed in every particular. The quantities issued are:—Spirits, 2 drams per diem, but no beer or wine; or spirits 1 dram with 1 quart of beer, or 2 drams of wine, or wine 4 drams but no beer or spirits.
VI. Diet.	1. The ration for Queen's British troops and the Indian European troops is the same. Bread 1 lb. Beef 1 lb., supplied 5 times per week. Mutton 1 lb. supplied 2 times per week. Rice 4 oz. Sugar 2 ½oz. Tea 5-7ths of an oz. supplied 5 times per week. Coffee 1 oz. 2-7ths supplied 2 times per week. Salt 1 oz. Vegetables 1 lb. Firewood 3 lb. The periodical changes are those of vegetables procured at the different seasons of the year. The Quartermaster sees that the rations issued by the Commissariat, are of the exact quantity, and of the first quality; the Orderly officer of the day inspects them every morning before they are issued, as well as after they are cooked, and reports to the Commanding Officer that he has done so; and it is the duty of Company officers to see that their men get the full quantity of rations to which they are entitled. 2. A complete ration, including vegetables, is provided for the troops, but no fruit. The stoppage for one day's rations is three annas, four pice. The proportion of vegetables to every man is 2 ozs. of onions, 8 ozs. of potatoes, and 6 ozs. of other kinds of vegetables that may be in season. 3. Every article is of good quality and sufficient in quantity. No improvement is required. The cooking is superintended by the mess man, and every means taken by the orderly corporal and messman to prevent rations being improperly disposed of. 4. Frying pans and boilers in the proportion of one to every 25 men are supplied by Government for cooking. The kitchens attached to the barracks are clean, light, and well ventilated, and are well supplied with water. The artillery kitchen is clean but dark; there is a good water supply. The introduction of pumps would be an improvement. The rations are never served in joints, they are generally boiled and stewed with vegetables. The utensils supplied by Government admit of very little variation in the cookery. The cooking is good; tea and coffee are properly prepared. Tea and coffee is prepared for the men before a march, and arrangement is always made for refreshment of this kind half way on the march. 5. A piece of ground contiguous to the barracks has been allotted and is cultivated as a garden by the men; it affords them healthy and pleasant occupation during their leisure hours, and they benefit by the produce. Government liberally authorizes the gratuitous issue of garden implements, and every encouragement is given to the men to employ themselves in this way. For the regulations vide G.O.C.C, 22nd November 1856, No. 93.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of a tunic or shell jacket, woollen cloth trousers, shako or forage cap, and great coat during the cold and wet months of the year; khakee as summer clothing with helmet during the hot months. The accoutrements consist of cross-belt and pouch with bayonet belt. The present dress is suitable to the climate. On the hills warm woollen clothing should always be worn, and generally flannel next the skin; worsted socks and strong boots to resist the wet. The helmet and the present warm and light clothing of the army is calculated to diminish the effect of sun, heat, cold, wet, night air, or malaria, &c. The introduction of a serge dress in place of the shell jacket would be a great improvement. The present guard dress is shell jacket and woollen cloth trousers during the cold and wet seasons, and khakee clothing during the warm and sultry months. The men on guard are never exposed to the sun when it can possibly be avoided, they are protected by the guard rooms, verandahs, and sentry boxes.
Duties.	1. It is advisable that the men should be drilled at home. During the drilling of recruits in this country they have frequently to stand still for minutes together, and the sun then has great influence, causing them occasionally to faint. Fevers are often ascribed to this cause. 2. The following is the usual routine of soldiers' duties. Inspection in light and heavy marching order; guard mounting; brigade exercise; battalion field exercise; field training; light infantry exercise; guard and sentry duties; picket and outpost duties; escalading; target practice; route marches and gun drill. The amount of drill excepting for recruits is rarely more than once a day or 4 days in the week. The duration about 1 hour in the cool of the morning. The men do not appear to suffer in health from drill. The best hours for drills and parades is between 5.30 and 7 a.m., and for marches between 2 and 7 a.m. For regulations, see general orders *regarding* marches. The average number of nights the men have in bed during the week is 3; the regiments being chiefly composed of recruits at drill. 3. The most remote guard from the barracks is about two miles distant. Guards are relieved once in 24 hours; sentries every two hours. The roll calls by day are—5 a.m.; breakfast roll call 8 a.m.; 1 p.m. dinner; 5 p.m.; 8 p.m.; and at night one check roll at an uncertain hour, when the men are not disturbed, but counted by the orderly serjeant in their cots. Every precaution is taken to guard against the ill effects of night guards by suitable clothing.
VIII. Recreation and Instruction.	1. The following are the means of recreation and instruction:—There is a ball court and a skittle ground. There is an army school, but at present there is no trained schoolmaster or mistress. Arrangements are being made regimentally for the performance of these duties. There is both a garrison and a regimental library; the former is not lighted at night, but the

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References to Subjects and Queries.	Replies.
VIII. Recreation and Instruction—*cont.*	latter is sufficiently so. There are coffee rooms. There is a soldiers' garden, managed by a committee of officers and sub-committee selected from the men, who work in the gardens. There are no workshops except an armourer's shop, nor any theatre or gymnasia. The means of recreation, &c., are to a considerable extent sufficient to keep the men occupied during the wet season and heat of the day, but there is great room for improvement. During the hot weather the men are restricted to barracks from 9 a.m. to 4 p.m., which, doubtless, is beneficial to health. 2. The encouragement of trades amongst the men, by having workshops attached to the barracks, would afford useful employment, and relieve the monotony of barrack life. Many men, such as shoemakers, tailors, mechanics, &c., would, I think, go steadily to work at their trade if they had a shop to go to. 3. A soldiers' savings bank is already established, and is advantageous. 4. There is little or no shade from trees in the vicinity of the barracks, but there are verandahs the whole length of the inner face of the barrack-rooms in which the men can take exercise during the day, when the weather is not very hot. The artillery barracks have not sufficient shade from verandahs.
IX. Military Prisons.	1. The cells of this, one of the hottest stations in India, are very small, and built upon masses of rock, which must be intolerably hot, and most injurious to the soldiers' health.
X. Field Service.	1, 2. There are no local regulations for field medical service. The medical officer in the British army is always consulted as to the encamping ground &c., and it should be so in the Indian army. 3. The camp regulations for the preservation of health as laid down in the quartermaster general's regulations, are calculated to preserve the health of the troops. 4. The arrangements for field ambulances are merely doolies carried by six bearers, for each sick man, an excellent, but expensive carriage; also hospital sick carts on 2 wheels, drawn by bullocks for convalescents or men too weak to march, not a very easy or pleasant carriage.
XI. Statistics of Sickness and Mortality.	1. To be obtained from the Director-General of the Presidency.
XII. Hospitals.	1, 2. The garrison hospital is a private house. The European regimental hospital is detached from the barracks, 314 yards distant. It is in a line with and between officers' houses. The cavalry hospital is 66 yards from the horse lines. Shengcolum hospital is on open ground. Pootoor hospital is close to the bazaar of the regiment, but has an open space around it. All are situated in tolerably open positions. A wall, 9 feet high, surrounds the European regimental hospital, and one 8 feet high surrounds Shengcolum hospital. All the sites are well chosen; the European hospital stands on the highest ground in the station. There are no nuisances near the hospitals. 3. The water supply is just sufficient, and for the service of the hospital good. 4. The sewage is removed in casks by scavengers to a distance from the station. 5. The height of the lowest wards of the garrison hospital from the ground is 1 foot; those of the cavalry hospital 1½ feet; of the European hospital ½ foot; of the detached ward 2½ feet; of Pootoor hospital 2 feet, and of Shengcolum hospital 3 feet 8 inches. The wards are all paved with granite. The soil is very porous, and absorbs all drainage. A small trench conveys some of the rain fall into the nearest road trench, but there is no guttering. The garrison hospital is built of brick in mud; plastered. There are no ventilators. The walls are thick. It has a verandah 8 feet broad on one side. The cavalry hospitals are built of brick in chunam, with a ridge ventilator. Verandahs on both sides 9 feet wide. The European hospital of brick in chunam with gable ventilators. Verandah on both sides 10 feet wide. Pootoor hospital of brick in chunam. There are no ventilators or verandahs. This hospital has a terraced roof; the others are tiled. The walls are thick. Shengcolum hospital is built of brick in chunam with gable ventilators. It has a verandah on both sides 8 feet 7 inches. The European hospital faces east and has blinds. Verandahs are never used for the accommodation of the sick. Hospitals in India usually consist of one flat.

The following table gives the accommodation :—

	Wards.	Dimensions of Wards.				Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.		Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.	Feet.			
European Hospital	7	48½	18	18½	16,150	1½	6	5	4
		45½	18	18½	15,022	1½	8	5	4
		60½	18	18½	20,146	1½	10	5	4
		68	18	18½	22,644	1½	10	5	4
		50	18	18½	16,650	1½	9	5	4
		50	18	18½	16,650	1½	9	5	4
		50	20	13¾	13,750	1½	10	6	4
Native Cavalry Hospital reconstructed February 1859.	3	40	17	18 11/12	12,863	1½	16	3½	3
Garrison Hospital (very old)	1	33	18	17	10,098	1½	2	6	4
39th Regiment N.I. Hospital	—	59	20	17¾	20,945	1½	2	4	3½
		24	16	12½	4,800	1½	2	4	3½
		24	16	12½	4,800	1½	3	4	3½
13th Regiment N.I. Hospital	1	80	16	13 11/12	17,813	1½	12	3½	3
15th Regiment N.I. Hospital	1	80	16	13 11/12	17,813	1½	12	3½	3

All the hospitals are well placed as regards the prevailing winds, except the garrison hospital, which being a private house is surrounded by other houses. All the windows open inwards, and appear suitable in arrangement and construction.

6. The means of ventilation are by doors and windows and upper fan-lights. The wards are well ventilated. Bamboo blinds are used in the European hospital.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	7. Kuskus tatties, constructed of a double framework of plaited bamboo, with a kind of scented grass between, strongly bound with bamboos, and made circular in form, are used in the European hospital, but not elsewhere; these are kept wet with water, which renders the air cool and refreshing. 8. There are no means of warming the wards. There are no precise intervals for cleansing and whitewashing the walls; it is done about once a year, or oftener if necessary. 9. The garrison hospital has no privy. Night-stools are provided in serious cases in all hospitals. The privy of the cavalry hospital is a small tiled building, 20 feet from the hospital; it has no seats, merely a cover. The same at Pootoor and Shengcolum. The European hospital has a privy provided with seats, attached by a covered passage. They are regularly washed and kept pure by burning salt therein. They are cleansed by scavengers more or less frequently in the day. The arrangements admit of improvement. 10. The lavatories are attached to the end wards, and are sufficient for the purpose. 11. Portable baths are employed for warm baths when necessary, and a shower bath is likely to be attached to the hospital. 12. Washermen are engaged to cleanse the dirty linen; they take it away and bring it back when cleaned. 13. The storage is sufficient and dry. 14. A frame of wood on four legs, webbed together with tape, is used for a bedstead. The bedding is good. No improvement is suggested. 15. There is one kitchen at the back of all the present wards of the European hospital. When the female ward is completed it will be between it and the male wards. The food is cooked in large copper (tinned) vessels. The means for cooking are complete and sufficient, and the cooking can be varied as the medical officer may direct. 16. The diet table, &c. is according to regulation. 17. The attendants in number and office are according to general regulations, and are sufficient. The medical officer can always obtain extra aid if required. 18. The hospital is very healthy. No epidemic or hospital gangrene has occurred. 19. A female ward was required. It was sanctioned about 18 months ago, and may be completed in six months more. 20. Convalescents take air and exercise in doolies and sick carts; only those nearly well in the latter. They usually go to the brigade practice ground. The hospital enclosure being too small for the purpose, those who require walking exercise take it in front of the hospital guard-house on the regimental parade ground. 21. Soldiers' sick wives and children are now received into hospital, and attended to as regularly as the soldiers. A ward, one of the old ones, has been fitted up for them. Better arrangements are in progress. 22. The following are the special local hospital regulations :— *Orders for the Hospital Sentry.* "1. Take charge of the guard-room and arms. 2. Search all bundles and baskets by whomsoever carried. 3. Nothing is allowed into the hospital, except it is passed in by the hospital serjeant. 4. No bandies are allowed into the hospital compound, except the scavengers' bandy. 5. No one is allowed into hospital during the visits of the medical officer, except on duty. 6. Visiting hours for friends are from 8 to 9 a.m., and 4 to 5 p.m., from November 1st to April 1st; and 7 to 8 a.m., and 5 to 6 p.m. from 1st April to 1st November. 7. The hospital gate will be closed and locked at gun-fire every night, and no one (sick excepted) will be allowed to pass in, nor anyone to pass out, unless the assistant-apothecary personally direct the sentry to allow the party to proceed out." (Signed) C. G. E. Ford, Surgeon, Trichinopoly, Dec. 23, 1859. 2nd European Light Infantry. 23. The hospital is wholly under the control of the medical officer. Every requisition of his is immediately attended to, and his wishes complied with, if possible. Every hospital comfort necessary or desirable is immediately supplied at his request. 24. There is no convalescent ward, but a portion of a ward is set apart for those who wish to read the books and papers placed there. There would be no advantage in having a convalescent ward if it were a part of the hospital.
XIII. Burial of the Dead.	1. The burial ground is a clear open space at the south-west edge of the cantonment. The prevailing wind is westerly. 2. Its area is about an acre. The soil is red, gravelly, and dry. Decomposition is not likely to take place rapidly. The ground is carefully kept. 3, 4. The graveyard is very rarely offensive, so seldom that precautions have not been necessary. The space left between the graves is usually 2 feet, and the depth for adults 4 to 5 feet, and for children 3¼ to 4 feet, according to the nature of the soil. The ground is very rocky and hard; graves are never re-opened. There is no rule about the time of interment, but the nature of the climate has made it a necessity to inter within 24 hours after death, at all times. 5, 6, 7. The dead of the camp followers or bazaar people are buried or burnt by their own people, paupers by the police. No injury accrues to the public health by the present practice. No improvement is suggested.

(Signed) P. T. Cherry, Colonel, 1st Reg. Light Cavalry, President Sanitary Committee.
R. Budd, Major-General commanding Trichinopoly and Sn. Dn.
W. C. Palmer, Lieutenant Acting District Engineer, Trinchinopoly.
J. Dorward, Surgeon-Major, Garrison Surgeon, Trichinopoly.

13th June 1860.

(Many of the replies in this Report are signed by individual members of the Committee, Dr. Davidson, Deputy-Inspector General of Hospitals, and others.)

KAMPTEE.
MADRAS.

KAMPTEE.

Acccommodation
- Queen's Troops
  - Artillery - - 340
  - Infantry - - 1,056
- Native Troops
  - Cavalry - - 355
  - Infantry - - 2,040

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is a flat plain, extending in every direction for many miles. It is intersected by the rivers Kanhan and Pench, which join and form the northern boundary of the cantonment. The soil is black; dry in the hot and cold seasons, and retaining much moisture in the rains. There are numerous ravines and nullahs, but there are no tanks within six miles of the station. Numerous groves of mangoes and other trees, however, exist in the immediate vicinity. No jungle. 2. The elevation of the station above the sea is about 900 feet, Seetabuldee being 939 feet; but in most parts, the station lies on nearly the lowest level of the adjacent country, being on the right bank of the river. The highest point, which is about 500 yards west of the church, and which is from 30 to 60 feet higher than the river bank and general level of the cantonment, is not built upon. This rising ground is dry and open, very eligible for military building purposes, and has been approved of as a site for dragoon barracks by his Excellency Sir Patrick Grant. The only doubtful point regarding it is whether water would be readily found, to settle which experiments have not yet been made. 3. The nearest mountains or table land are those of Chindwarra, 75 miles north-west, and Seonie, 67 miles north of Kamptee, the height of each of which is about 1,100 feet above the station. There is another range of mountains with table land known as the Mattwer hills, 36 miles north-west of Chindwarra, and 2,150 feet above Kamptee, which are recommended as a sanitarium for European troops. By a direct road this sanitarium would probably be within 100 miles of Kamptee. 4. The nearest water is the river Kanhan, and the nearest tank is six miles west of the church at Surady. A large and deep nullah runs between the military part of the station and the Sudder bazaar; another runs into the Kanhan at the back of the commissariat godown, where there is also a tract of marshy land. At seasons which occur perhaps once in eight or ten years, when very heavy freshets come down the Kanhan river the water flows up the nullah and over the low ground between the artillery lines and the commissariat godown, also over a tract of low ground on the river bank at the north side of the European bazaar. It has been known even to flood the bazaar itself. The overflow only lasts a day or two. There is a great extent of broken ground in the vicinity of the station, and very many deep nullahs in all directions. 5. The station is thickly planted with trees and hedges, there are also gardens, nevertheless, in most parts the exposure to wind is sufficiently free. The native bazaars, particularly the European bazaars, are far too densely built over. No regular plan would seem to have been formed for them, with the exception of a good main street. The outskirts of these bazaars are a perfect labyrinth of wretched huts. The temperature of the station is doubtless very much raised by reflected sun heat, and by the smoke of many fires for cooking. The station is exposed to every wind which happens to blow. The hot land winds are very distressing in May, and until the rains set in in June. The distance of the station, in a straight line from the sea, being 400 miles, no mention of the sea breeze need be made. 6. The surrounding country is cultivated with dry grain. There is no irrigation, except for gardens, which are numerous in the immediate neighbourhood of the station itself, but this does not affect the health of the troops. There is no cultivation of rice or indigo. Hemp is, however, cultivated without the station limits, but the steeping of it, which is the only noxious condition of its cultivation, is not allowed within the station limits. 7. The large city of Nagpore is within 10 miles of the cantonment. No other large town is near the station, but the native population of the station is immense, being not less than 70,000. 8. The soil of the plain upon which Kamptee stands is principally black. It is formed of decomposed trap and gneiss, more or less tenacious and retentive of moisture, and much pervaded by nodules of limestone. Red and white sandstone are found near the surface in many places, especially on the left bank of the Kanhan river. Limestone also exists in beds near the surface. The cantonment was formed about 40 years ago, the ground having been previously occupied. 9. Water is found at various depths; during the dry season at from 25 to 50 feet, and during the wet season at from 15 to 40 feet below the surface. 10. The black soil is very retentive of moisture. The heavy rain-falls mostly drain away into the river. The soil as it dries after the rains opens out into deep cracks and holes, from which no doubt exhalations from the moister subsoil arise. The water does not lie on the surface long; evaporation is of course great. No drainage from any high ground passes into the subsoil of the station; the water from such higher levels, when in excess of what can be retained by the soil being carried off in nullahs to the river. 11. The water for drinking purposes and for public cattle, as also for gardens, is obtained from wells; that for private herds of cattle, and for washing, from the river. There are no tanks in the station or the immediate neighbourhood to cause malaria. 12. There are several hundred wells, the water in which is of various quality according to the well, but is mostly good, pure, and inodorous. The river water is turbid in the rains, and in the dry season foul and polluted with the refuse and filth of the bazaar. For the past 10 years there has always been a good supply of water in Kamptee, and no ill effects have arisen from imbibing it. Water for irrigation is raised by bullock draught, cords, and buckets. No

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	better supply could be obtained unless by damming up the Kanhan river in a high level above Kamptee, and thus to lead a constant supply of water through the station by means of channels. 13. There are no other topographical points bearing on the health of the station. 14. New stations are selected by decision of Government, based upon reports of mixed military and medical committees; no better plan can be suggested.
II. Climate..	1, 2. The instruments available for meteorological purposes are thermometers, barometer, hygrometers, and pluviometers. Monthly meteorological tables and returns are forwarded to the medical board; they only pass through the office of the chief medical officer of the command, en route to Madras; copies are not kept in Kamptee. The tables may be obtained on application to the medical board. 3. The climate partakes of both heat and cold. The year is divided into three seasons, cold, hot, and rainy, transitions of which are regulated, and may be calculated at certain periods. The cold season commences about 20th October, December and January being the coldest months, the temperature at the time being 68° in the house, and as low as 38° at sunrise outside. The hot season is from the middle of March till the 20th June, the thermometer ranging in the house from 85° to 98°. The rainy season, preceded by great atmospherical disturbances, and finally distressing sultriness, which often induces languor, restlessnes, and general malaise, with a sensation of great exhaustion, feelings which depend probably upon electrical influences, as they vanish almost immediately upon a changed condition of the atmosphere occurring. There is a considerable diurnal range of temperature in the cold season, which is extremely prejudicial to weak constitutions, and to such as have been debilitated by disease or other causes, unless great attention be paid to precautionary measures, such as appropriate clothing, regularity in diet and habits, and taking regular exercise in the open air morning and evening. There are usually heavy dews, which are highly beneficial for agricultural purposes; and in the early part of the season fogs prevail, more particularly along the ravines and nullahs, where moisture exists to a greater extent than in the open plains. The mean temperature at this time may be stated at 68° in the house, the lowest observed outside has been 36° Fahrenheit, and the highest 110° from noon to 3 p. m. The rainy season is generally the most unhealthy. Cholera, however, prevails in March and April, as also in July and August, and fevers and diseases of the bowls at the same period. 4. There is a range of hills about 100 miles distant, about 3,600 feet above the sea, whereon are several localities where troops might be stationed with advantage. 5. The following are the stations at which I have served, with remarks on their comparative salubrity; (1), Masulipatam, unhealthy; (2), Vizianagram, healthy; (3), Burmah, healthy; (4), Western coast, indifferent; (5), Vellore, not unhealthy; (6), Samulcottah, indifferent; (7), French rocks, healthy; (8), Trichinopoly, healthy; (9), Bangalore, healthy; (10), Kamptee, healthy.
III. Sanitary Condition of Station.	1, 2, 3. A map of the adjacent country, with plans of the station and barracks, are forwarded. 4. Table of Barrack Accommodation. Date of construction of barracks, between 1820 and 1844; 10 ranges, all built at different periods. Total number of rooms or huts, Infantry 10 ranges of barracks, Artillery 3 ranges. Total regulation number of non-commissioned officers and men, Infantry, 1,056, Artillery 340.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per man of Floor Space.*	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				No.	Height.	Width.
British Infantry.											
1 centre room	—	91·5 91·5	24 24	16·5 7/2	43,920	—					
2 end rooms, each	—	59 59	24 24	16·5 7/2	For the two, 28,320						
4 side verandahs each, in two portions, each portion.	—	64·5	10	13	For the four, 33,540						
4 serjeant's rooms, each	—	19 18·75	10 10	13 13	For the four, 19,630						
4 lobby rooms, each	—	12 12	11 11	16·5 7/12	For the four, 9,636						
Total	—	—	—	—	163,366	—	—	—	28	7	4½

* It is presumed this intends the privates only, who all sleep in one ward. The total superficial area of the men's sleeping rooms is 5,028, and this divided by the number of occupants will give the answer required.

KAMPTEE. MADRAS.

Table of Barrack Accommodation—*continued.*

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				No.	Height.	Width.
Horse Artillery.							For the whole.				
Men's room	—	199·5 199·5	25·25 25·25	17·25 7·5/2	105,785	—	4,240*				
Verandahs, one in each side, each	—	199·5	8	13·75	For the two, 43,890						
3 serjeant's rooms, each	—	10 10	25·25 25·25	17·25 7·5/2	For the three, 15,908						
2 verandahs, one on each side, each	—	10	8	13·75	For the two, 6,600						
Total for the whole of 1 barrack	—	—	—	—	172,183	—	—	—	35	5½	4½
Foot Artillery.							For the whole.				
4 men's rooms, each	—	55·5 55·5	24 24	15 10/2	For the four, 66,560	—	5,328*				
2 end rooms, each	—	12·5 12·5	24 24	15 10/2	For the two, 12,000						
2 end rooms, each	—	18 18	24 24	15 10/2	For the two, 17,280				None; all doors.		
2 end rooms, each	—	8 8	24 24	15 10/2	For the two, 7,680						
2 verandahs, one on each side, each divided into portions,—											
2 portions each	—	12·5	10	14	For the two, 3,500						
5 portions each	—	27	10	14	For the five, 18,900						
Total for whole of 1 barrack	—	—	—	—	125,920						
British Infantry guard room	—	131·75	60	48	8,269·581	—	2,320	—	6	20	16
Prison cells, 12 in number	—	8	8	12	768	—	64	—	3	6	2½
Horse Artillery guard room	—	28·5 28·5	16 16	14·75 6/2	8,094	—	456	—	2	5½	3½
Front inner verandah	—	60·5	8	11	5,324	—	484	—	4	5	3½
Rear inner verandah	—	25·6	8	11	2,253	—	205	—	—	—	—
2 prison rooms, each	—	16 16	16 16	14·75 6/2	3,904	—	256	—	1	2½	5½
These are all under one roof.											
Foot Artillery guard room, itself	—	23·75 23·75	17·5 17·5	14·5 6/2	7,273·5	—	415·5	—	None; arches and doors,		
Enclosed verandah	—	44	8·25	12·25	4,446·75	—	363	—	None; all doors.		
Do. do.	—	23·75	8·25	12·25	2,400·25	—	196	—	Do. do.		
2 prisoners' rooms, each	—	17·5	8·25	12·25	1,768·5	—	144·5	—	1	5	4
2 cells, each	—	8·75	8·25	12·25	884·25	—	170·25	—	None; doors.		
Detached prison room	—	18	13	13	3,042	—	234	—	5	2½	4
These are all under one roof.											

* It is presumed this intends the privates only, who all sleep in one ward. The total superficial area of the men's sleeping rooms given above, divided by the number of occupants, will give the answer required.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides in the outer walls of the verandahs, and are unglazed. There are no Venetians, only shutters. There is a verandah on both sides from end to end of the barracks, 10 feet wide and 16 and 10 feet high. They are never occupied as sleeping quarters, either by the soldiers or others. There are neither jalousies or jhilmils to barracks. 6. The bedsteads used in barracks consist of three boards laid on two wooden trestles about 18 inches high; there are no cots. The bedding consists of a quilted mattress, stuffed with cotton, sheets and blankets. In huts of the native army the soldier makes his own arrange-

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	ments. Clean straw is provided by the Commissariat for European soldiers in tents, but none is supplied to native soldiers. The height of barrack cots above the floor varies from 2 ft. 2 in. in old pattern, to 1 ft. 6 in. in the new. The hospital cots, both wooden and iron, are 1 ft. 6 in. in height. 7. The European tent is an oblong rectangular poled tent with outer walls only, but with a double fly and two doors. The dimensions are as follows:—Area of ground within walls 21 ft. by 15 ft.=315 square feet of area; height of walls 5 feet; height of poles to top of inner fly 9 ft. 3 in.; between flies 1 ft. 6 in. They are to accommodate 25 men in ordinary marches and 20 men on field service. Area per man on ordinary service 12½ ft.; on field service 16 ft.; cubic contents for each man on ordinary service 88 ft.; in field service 110 ft. The Native tent is a 2-poled tent, with a ridge pole, fly, and walls all in one, in shape oblong, rounded at the ends, with one door. The tent rises in the shape of a cone from the ground on all sides to the ridge pole. The dimensions are as follows:—Extreme length 22 ft.; extreme breadth 12 ft.; height of pole 9 ft. 3 in.; total area 240 sq. ft.; total cubic contents 1,080 ft. They accommodate 25 men each in ordinary marches, and 20 men on field service; area for each man on ordinary service 9½ sq. ft., and on field service 12 sq. ft.; cubic contents for each man on ordinary service 43 ft., and on field service 54 cubic ft. 8. In the European barracks at Kamptee the ventilation is most faulty and deficient. They are provided with ridge ventilators of a partial description, viz., 3 openings in the roof of each barrack, which contains 80 or more men. There is no ventilation for tents or huts, and guard rooms have seldom anything except doors and windows. The ventilation is certainly not sufficient when the barracks are full. Punkahs are hung in each barrack, under which stand the soldiers' cots. An allowance of 20 rs. per month per company is granted by Government to pay coolies who pull the punkahs night and day. This allowance is continued throughout the year, although only required from March to September. Kuskus tatties are furnished by the Commissariat, and fitted into the windows. These are kept watered all the day at the expense of Government. 9. The barracks are built of brick and lime on stone foundations, and have tiled roofs. Tents are made of 3 plies of strong cloth, the inner one being blue. The huts of the native soldier are principally mud walls, and tiled roofs of a very thin and fragile material. 10. The flooring of the barracks are flag stones. The floors are raised above the ground several feet, but there is no means provided for free passage of air beneath. 11. The materials of the barracks are proper enough, but their construction is faulty according to the present improved notions of European barracks. From 80 to 100 men are massed under the same roof for all purposes of eating and sleeping, which is highly objectionable, when for many months of the year the men are confined to their barracks for 20 out of 24 hours. The barracks at Kamptee are too low. The windows ought to be glazed and and Venetians also. The barracks are kept in repair by the Engineer department. There is always great delay in the execution of either repairs, alterations, or improvements. A sanitary committee, of which the brigadier commanding is president, is answerable for the state of the cantonment. The walls and ceilings of barracks are whitewashed generally once a year, but can be done whenever required. 12. Lavatories are built and being built for each troop and company. They are supplied with water from adjoining wells by water carriers. There are no swimming baths, they will be built in due course, having been sanctioned by Supreme Government. No proper means of drainage have yet been constructed; the water is conducted along channels from each wash-house to openings in the wall of the barrack yard, and from thence it flows away as it best can. 13. The cooking of the soldiers' food is well done by native cooks in the cook-houses adjoining the barracks, and sufficient water is supplied from wells by water-carriers. The refuse water is got rid of in the same manner as described for the wash-houses. A complete system of drainage for all the barracks has been estimated for, and will be constructed as soon as possible. No washing of linen takes place in barracks, native washermen performing the work at the river side. 14. The contents of the privies are not drained, but carried off by filth and urine carts supplied by Government, to a considerable distance outside the station. 15. The privies have no proper ventilation, two or three small oval holes at the gable ends to admit light, being all the ventilation they have. They are most objectionable in their present state. Each barrack is lighted at night by six globe lamps hanging from the roof. There is one lamp in each privy. 16. No arrangement exists for draining the barracks. Beyond the means before described there is no drainage. I am not aware that any dampness exists in any public building in this cantonment. There is no drainage to the European barracks, and the water left by the rains, and which does not find its way through the openings in the barrack yard wall, is allowed to stagnate, evaporate, or sink into the subsoil. The holes outside the barrack yard, which receive the refuse from the cook-houses, are emptied twice a day by native coolies kept for that purpose. These holes are only dug in the earth, and consequently are a mass of mud and filth. The cesspits are mere holes dug in the earth about 3 feet deep, and 3½ feet square. The distance of the wells from these pits varies from 30 to 60 yards. They are about 60 yards from the nearest end of any of the barracks, and the hospital is more than a mile away; they are emptied twice a day. There are no foul ditches as far as it can be prevented by the active interference of the police, but with a native population of some 70,000 souls, there must be an immense deal of filth around and about, but every means are taken to prevent it. 17. A conservancy establishment of scavenger carts and sweepers is kept up for the surface cleansing of the cantonment, and one cart is allotted to each corps to keep the lines clean. The cleansing is performed daily, each cart working eight hours. It is supervised by the assistant quartermaster-general. The filth and refuse is carried in carts and in buckets to filth-pits which are dug in convenient places in the outskirts of the station, and are filled up and closed in succession; when filled, fresh pits are dug as fast as required. 18. The surface of the cantonment is kept free of vegetation. The rank grass is eaten down by cattle in the rainy and cold season. In the hot season there is no grass or vegetation to be kept down. There are no old walls, &c., to interfere with the ventilation of the station or bazaar, the cantonment being kept free from all such objections.

KAMPTEE, MADRAS.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	19. There are closed drains in the principal streets of the baazar, and watercourses and drains elsewhere, running into a large nullah. The ventilation of the baazar is imperfect in some places, but crowding is not permitted now. There are 220 wells in the bazaar, and water is also obtainable from the river. There are no tanks: there are 17 public latrines for men, and 17 for women. There is a sweeper to each street to preserve cleanliness, and for some time scavenger carts have been in use. Butchers and others, whose trades cause filth to accumulate, are obliged to keep mehters, and are strictly supervised. All filth is thrown into pits in the streets of the cantonment. Persons committing nuisances are closely watched and taken up daily. A fixed establishment ought to be allotted for sanitary police purposes. Owing to the faulty manner in which, many years ago, houses of a poor kind were allowed in some places to be huddled together without order, and owing to the irregular nature of the ground, intersected by nullahs, making the houses difficult of access, it is not easy to maintain cleanliness around them as might be wished. All cattle refuse is removed outside the cantonment daily. Cesspits, where accessible, are cleansed every 48 hours, and persons allowing dung-heaps are punished. The European bazaar, which contains some 10,000 natives of all sorts, is situated about 500 yards from the European infantry barrack, in a north-easterly direction; when the wind blows from that quarter, and should there be any infectious disease in that locality, it is possible it might be detrimental to the soldiers, but otherwise no particular nuisance is experienced from wind blowing over the native dwellings. The former inconvenience could only be prevented by removing the bazaar from its present locality. 20. Animals for the use of the soldiers are slaughtered at a distance of about 800 yards from the nearest point of the nearest barracks, and no nuisance has ever been experienced, that I am aware of, from the position of the slaughtering places. 21. There is no stabling or picketing ground for the horses of bazaar residents or camp followers; owners keep their cattle in stables attached to their residencies, and cleanliness is enforced in these as in all other conservancy matters. 22. The artillery and cavalry stables, for sick horses, consist only of open buildings divided by a wall 10 feet high down the centre. The hospital is nearly a mile distant from these buildings, and they are a considerable distance from the barracks. The dung-heaps are arranged on one flank of the horse lines, and are purchased and conveyed away by villagers for cultivation purposes. The horse and foot artillery picketing grounds are arranged so as to admit of the horses being picketed by divisions, the former about 1,200, and the latter about 800 yards from the hospital. 23. The quarters for the married men of the European infantry regiment at Kamptee are most objectionable in every respect, but they are only of a temporary nature. The same may be said of the married mens' quarters for horse and foot artillery. No married people occupy barrack rooms.
Officers' Quarters.	1. There are no public quarters for officers; they reside in small detached houses in rear of their respective regiments; no improvement in them is required. Remark by the Commander-in-Chief—"For my observations on the condition of the "public buildings at Kamptee, and the alterations and improvements I consider necessary, "see my Inspection Tour Report of February 1859. Frequent representations were sub- "sequently made with respect to the continued faulty state of the buildings and cantonment "generally, but no result has followed. (Signed) P. G."
IV. HEALTH OF THE TROOPS.	1. The station itself and the adjoining native population may be generally considered healthy. 2. The principal diseases among the natives are fever, small-pox, cholera, and diseases of the stomach and bowels. Spleen disease is not prevalent. 3. Irregularity in diet and indulgence in bang and liquor are the chief causes of disease among those who suffer more than others. 4. The A Troop Horse Artillery previous to its arrival at Kamptee had been on field service in Bundlecund for 2 years; it arrived here in 1860. Its state of health when in the field was very good; the prevailing diseases being fever, and diseases of the stomach and bowels. The same class of diseases have since been prevalent here. The Madras Foot Artillery have been in Burmah and St. Thomas' Mount previous to being stationed here. They arrived at this station in 1857. The troops while in Burmah and at the Mount suffered chiefly from fever, diseases of the stomach and bowels, and rheumatic affections; since their arrival at Kamptee they have suffered from fever, diseases of the stomach, and venereal diseases. The present accommodation of the men is much on a par, and sickness does not prevail more in one portion of the station than another; when sickness does occur it will be found chiefly among the native inhabitants in the bazaars. 5. The troops at the station are never camped out. 6, 7, 8. I have never been in charge of troops at hill stations, but hill sanitaria are decidedly advisable. 9, 10. Troops on going to hill stations are liable to occasional fever, and to enable them to derive benefit from such residence, attention should be paid to their diet, clothing, shelter, duties, and exercises. 11. I cannot speak from experience as to the seasons best adapted for residence at hill stations, but it is generally believed to be from November to May inclusive. The shortest period to obtain benefit from such residence is from one to two years. 12. I should consider that there was no period of residence beyond which injury is ikely to be inflicted on the health of the troops on returning to service in the plains. 13. There are no particular precautions required for protecting the health of troops on returning to service in the plains. The same precautions should, however, be observed on leaving hill stations as are observed on troops first landing in India. 14. I should consider it advisable to locate soldiers serving in India on the hills with short periods of service in the plains. Frequent changes of station in the plains also is beneficial to the health and spirits of troops. 15. No experience of the barrack accommodation at hill stations or sanitaria. 16. The elevations most suitable as sites for hill stations are between 4,000 and 7,000 feet above the sea. 17. Mathoor and Chekuldee, about 3,600 feet above sea level, could be advantageously occupied as hill stations. They are both about 100 miles from Kamptee.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	18. There is no particular class of surface and subsoil more healthy or unhealthy than others for stations. Gravelly soils may perhaps be considered the best, as more easy of drainage and less likely to generate malaria. 19. The best time of life for strong athletic men to proceed to India is about 20 years of age, though older soldiers on first landing in India thrive well. Troops should land in India in the cold season. On arriving there they are usually marched at once to the barracks at Poonamalee or Saint Thomas' Mount, and exposed as little as possible, but the clothing is often not suited to the climate. Drills take place in the mornings and evenings; marches commence from 2 to 3 o'clock in the morning, and terminate about 7 or 8 a.m. Every possible precaution should be taken to guard unacclimatized soldiers, on first landing, against exposure in the high temperature of the tropics. The barrack accommodation should be ample, not less than 1,500 cubic feet of space for each individual; the clothing should be clean and adapted to the particular season; the men should have suitable rooms for washing and bathing; the food should be good and nutritious, with a proper proportion of vegetables; animal food should be taken only once a day; beer should be the only liquor allowed, and should this not be procurable, good spirits sufficiently diluted might be substituted; no pure or raw spirits should ever be allowed; drills and parades should be of short duration, and in the cool of the mornings and evenings. 20. I consider that troops landing from the Mediterranean, Cape, and Mauritius, are better prepared for the Indian climate than those coming direct from England. On landing all means should be adopted to initiate them gradually to the heat of the plains of India, and for this purpose hill stations are desirable in the first instance. 21. Troops are transported from the port to the interior by land. The marches should be short, and they should commence a little before daylight. Great care should be taken in the selection of encamping grounds, which should be high and dry. 22. A British soldier should serve in India from 12 to 18 years. 23. The manner of conducting the business of medical boards as regards invaliding does not avoid a conflict of opinion, because appeals are often made by officers commanding regiments to military committees. Those committees, from the want of the required professional knowledge, cannot possibly form a correct opinion on the various cases brought before them, it is, consequently, often opposed to the opinion of the medical board. 24. Invalids should leave India for home in the cold weather, so as to arrive in England in the early part of the summer.
Diseases.	1. There are weekly inspection parades for the discovery of incipient diseases at the station. 2. Three cases of a scorbutic nature occurred in the artillery in September 1859, attributable to the supply of vegetables being insufficient and the quality inferior. A better description of vegetable is much required; during the hot and rainy months the supply is most inadequate. This has been repeatedly reported. 3. In the artillery the proportion of hepatic disease during the last three years has been $\frac{1}{36}$ to the whole admissions. Its causes are high atmospherical temperature, exposure to the sun's rays, improper food, and the abuse of spirituous liquors. Malaria must also be considered a cause, as likewise bad ventilation of barracks. It is not frequently the consequence of other diseases. The prophylactic measures are as follows:—proper clothing, cleanliness and frequent ablutions to be enforced, an appropriate diet, including animal food only once a day, no issue of raw spirits. When spirits are issued they should be diluted as in the navy. All parades and drills should be at suitable hours in the mornings and evenings. 4. No cases of dracunculus have occurred at the station. 5. In the artillery, during the last three years, the proportion of venereal affections to the total sick has been $\frac{1}{5}$th. The only precautionary measure which is likely to be of service is the establishment of lock hospitals. They are about to be established. 6. The troops occasionally suffer from epidemic disease, but not to a great extent. I allude to cholera and small-pox. Fever of an endemic or malarious origin is often prevalent; intermittent and remittent are the usual types. The following table shows the admissions to total admissions, and deaths to total deaths from diseases of this class:—

Diseases.	Admissions to Total Admissions.	Deaths to Total Deaths.
Fevers	$\frac{1}{5}$th.	$\frac{1}{17}$th.
Dysentery	$\frac{1}{18}$th.	$\frac{1}{5}$th.
Cholera	$\frac{1}{724}$th.	$\frac{1}{17}$th.
Small-pox	$\frac{1}{262}$th.	$\frac{1}{17}$th.
Rheumatism	$\frac{1}{338}$th.	$\frac{1}{17}$th.

	7. The most frequent zymotic diseases are intermittent and remittent fever, small-pox, diarrhœa, dysentery, and cholera. These diseases are most prevalent from February to the end of October. The climatic and atmospheric conditions during this period are the extremely high temperature and dryness of the air during the hot months, and the occasional closeness and stillness of the atmosphere. The greatest precautions have been adapted with respect to sanitary measures generally for the bazaar and native dwellings at Kamptee, and with much success. 8, 9, 10. Sentry-duty in the night, from the exposure to the influence of malaria, is no doubt the principal cause of fever at Kamptee, and during the period of the prevalence of epidemic disease, the same duty must tend to induce an invasion of the prevailing epidemic. The duties in barracks are not of a description to materially influence the health of soldiers. Prophylactic doses of quinine have not been tried.
V. Intemperance.	1. In the horse and foot artillery the majority of the men are temperate, but a considerable number are intemperate. The British infantry regiment (H.M's. 91st) are far less intemperate, the confirmed drunkards being certainly not 2 per cent. 2. Since December 1858 the proportion of admissions in the hospital of H.M. 91st Regiment at Kamptee have been, from diseases directly caused by intemperance, 1 per

References to Subjects and Queries.	REPLIES.

V. Intemperance—*cont.*

cent. on the total admissions. The admissions indirectly from the same cause is 1·74 per cent to the total.

STATISTICAL TABLE of ADMISSIONS into HOSPITAL of H.M.'s 91st REGIMENT.

	Number of each Class.	Number admitted into Hospital.	Number died.
Total abstainers - - - - -	25	5	—
Temperate - - - - -	661	1,040	16
Intemperate - - - - -	54	43	6

STATISTICAL TABLE of ADMISSIONS into HOSPITAL of ARTILLERY FORCE.

	Teetotallers.		Temperate.		Intemperate.		Tee-totallers.	Tem-perate.	Intem-perate.
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.			
Total Admissions for 3 Years - - -	6	—	548	14	180	3	—	141	269
Average Strength for 3 Years - - -	12		302		72		—	—	—

Drunkenness is always punished as an offence, and in the British regiment stationed here the commanding officer never allows captains of companies to dispose of cases of that description.

3. Distilled spirits (arrack) are sold in the canteen and licensed houses in the bazaars, and one to two drams are taken by five-eighths of the men of the artillery daily. Spirit is not part of the ration for the soldier at this station. The quality is excellent, and the full amount allowed to each man in 24 hours is 2 drams in the artillery, and 1 dram per diem in the British infantry. The spirit is supplied by the Commissariat, but it is quite optional to take it. It is not procurable at the canteen before 1 o'clock p.m., and it is never given as a ration to convalescents. No drinks injurious to health, other than intoxicating drinks, are sold at the canteen or bazaars.
4. The present mode of issuing pure spirits to the troops is in my opinion injurious. Spirits properly diluted, and in moderate quantity, are considered conducive to health by the medical officer, but they cannot be conducive to the efficiency or discipline of the corps.
5. There can be no doubt that it would be beneficial to the health of the troops to suppress the sale of pure spirits in canteens and bazaars, and substitute beer, tea, coffee, and at dinner light drinks.
6. Good malt liquor would be decidedly more beneficial to health than any description of spirit, and the introduction of wine would I think be beneficial.
7, 8, 9. Coffee, tea, lemonade, and similar drinks are used to a considerable extent in regimental canteens. These are of course superior to spirits and malt liquors, inasmuch as they are harmless. If spirit cannot be issued otherwise than in a pure state, I am of opinion that it would be beneficial to health to suppress altogether the issue of spirits, and to subsitute beer, tea, and coffee.
10. I have no recommendation to make on these points beyond what is comprised above.
11. The canteen regulations as published in the general orders of the Presidency are strictly obeyed.

VI. DIET.

1. The soldier's ration consists of bread 1 lb., beef or mutton 1 lb.; rice 4 oz.; tea $\frac{1}{2}$ oz., or coffee $1\frac{1}{2}$ oz.; salt 1 oz., and vegetables 1 lb. The rations are issued daily by the Commissariat subordinates to the quartermasters of regiments. If any article is considered objectionable, a board of officers is immediately called, whose decision is final.
2. The men have three meals daily. Breakfast consists of bread, butter, and meat, sometimes eggs, with tea and coffee. Dinner, beef or mutton, rice and bread, and vegetables when procurable. The evening meal is tea or coffee with bread and butter, anything extra is allowed to those who may be disposed to pay for the same. Each man is allowed to have from the canteen daily, if he chooses, 1 pint of beer or porter and 2 drams of arrack, or double that quantity of beer or porter with half of arrack. 1 lb. of vegetables is the daily ration; when not procurable, compensation is allowed to the men.
3. The men are well fed and cared for, and have plenty. The food is good. A regular supply of a variety of vegetables is the chief desideratum. I know of no alteration required in this respect, but a few ounces of cheese 3 times a week, although a luxury, would be much appreciated. The disposing of rations by soldiers has never been heard of.
4. To each company barrack is attached a cook-house containing all the usual apparatus in an Indian cook-room, but an Indian kitchen can never be clean. There is sufficient light and ventilation in them for native cooks, and all the water required is supplied by the water-carriers. Baked, stewed, and curried messes are usually prepared. The food is never either roast or boiled. The cooking is fairly done, and varied according to means; very good tea and coffee are supplied and prepared for the men. In every regiment arrangements exist by which every soldier can have a cup of tea or coffee before parade or march in early morning; many regiments send on a portion of their cooks in front, so as to have coffee prepared midway on line of march, which is very beneficial.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	5. A large piece of ground has lately been made over to the Commissariat department at the station for the formation of a vegetable garden for the use of the British troops. The soldiers have nothing to do with the cultivation of this garden. They have their own gardens independent. This matter is entirely in the hands of the commissariat department, and if successful it will be a great boon, as it is intended to produce every description of European vegetable, which are not cultivated by the natives.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of a cloth tunic, cloth trousers, shako for artillery, wicker helmet for infantry, and forage cap. The established summer clothing for all arms is the complete suit of khakee and wicker helmet with quilted cover. I consider the present dress quite suitable according to the season. The summer's khakee clothing is very much worn, and the cloth tunic, perhaps, not much more than 2 months in the year. A fixed fast colour for khakee clothing is very desirable; at present no two men are alike. I know nothing better than the light dress and wicker helmet lately introduced, with the cloth tunic, according to season, climate, and station. In wet or cold weather guards always mount with their cloaks to be worn according to requirement. An European sentry is never placed on duty outside during the heat of the day without the protection either of a verandah or a thatched covering, N.B. the khakee is a brown linen dress made loose and easy in every way.
Duties.	1. I think every infantry soldier should be thoroughly drilled before he comes to India. Artillery recruits for horse and foot are drilled at the recruit depôt before being sent up country, and go through the full instruction. The depôt for instruction is an institution admirably adapted for the purpose. 2. The usual routine of a soldier's duties is guard duty about once in 7 days, and drill, exercise, or parade for about an hour or less every morning. I have never heard of the men's health suffering from these duties. The best hours for drills, parades, and marches are, in the cold season, from 6 to 8 a.m., and in the hot season, from 5 to ½ past 6 a.m. Evening drills and parades are not usual, except for recruits, and the hour for such is always fixed according to season, from 1st May to beginning of June no evening drill of any sort is allowed. The general orders on this subject are that no corps is to be under arms between the hours of 8 a.m. and 4 p.m., except on occasions of public ceremony or general assembly of troops. The horse artillery have 3 consecutive nights in bed; the foot artillery 8; the British infantry 7, and the native infantry 5. 3. The parade ground for general guard mounting is, nearly a mile from some of the regiments in cantonment, but guards are generally mounted from regimental barracks. All guards are relieved every 24 hours. There are the usual roll calls by day, but there are none at night after ¼ past 8 o'clock. I have never heard of health suffering from the ordinary routine of night duties, and nothing beyond the usual precautions of dress according to season is required.
VIII. Instruction and Recreation.	1. The means of instruction and recreation at the station are as follows:—The artillery have a ball court; none has yet been built for the British infantry, but there are excellent covered skittle alleys for both. Both also have good school-rooms, but the 91st have no schoolmaster. There is a good garrison library; not however open for use at night. Day-rooms are established in both the artillery and H. M. 91st, but the accommodation is inferior. A large piece of ground is allotted to each arm for the purpose of a garden. There are no workshops, theatres, or gymnasia, but in 3 of the barracks of the 91st Regiment excellent theatrical representations are given at intervals. The above are not sufficient by any means to keep the men occupied during the wet season and heat of the day. By regimental arrangement there is restriction from exposure out of barracks when off duty according to the season. During the hot season the men are not allowed outside between the breakfast meal and evening parade at 5 p.m., and such restriction is beneficial to health. At the same time the want of proper amusement makes this restriction very wearisome. 2. The improvements suggested in the means of recreation are, the construction of a sufficient building for the combined purposes of a soldier's shop; coffee rooms; rooms for bagatelle board and other games, and reading-room. This room should be such as to induce the soldier to retire there during the heat of the day to read, write, and amuse himself, and should be lighted of an evening for the same purpose. Places of this description on a small scale are established both in the artillery and H. M. 91st Regiment. 3. Soldiers' savings' banks already exist, and the value of such is proved by the increasing number of depositors. They cannot I think be too much encouraged. 4. There is no shade whatever for exercise, and the long hot days must be most wearisome to the soldiers during the months from 1st March to end of June.
IX. Military Prisons.	1. There is no military prison or prison establishment of any kind at this station. There are a number of small cells erected at a distance of half a mile from the barracks, but there is no house or quarters for the provost officials of any sort. They are incapable of being used, in consequence of the heat and confined space for nearly eight months in the year. Their ventilation is defective, and prejudicial to health, and the space in cubic feet is not more than about 800 in each cell.
X. Field Service.	1. There are no local regulations for field medical service not included in the General Presidency Regulations. 2, 3. The happiest results proceed from the care and discrimination of executive medical officers in their selection of encamping grounds. The hours of march vary; refreshments *en route*, supplies of all kinds being carefully examined in camp, and hygiene generally attended to. 3. The powers of the medical officer are great, and his opinions on all matters of sanitary influence for troops in camp meet with all attention. 4. In the Madras Presidency a field surgeon is appointed, who has the regulation of field hospitals, ambulances, &c. The sick are carried in doolies, and hospitals are occasionally formed in healthy stations when the army may be in advance. Carts are expressly fitted up for the conveyance of stores, and medical supplies are always at hand, carried in chests properly fitted up. A medical storekeeper accompanies the force, who has control of these matters.

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References to Subjects and Queries.	REPLIES.

XI. STATISTICS OF SICKNESS AND MORTALITY.

TABLE showing the PRINCIPAL DISEASES of the NAGPORE FORCE for 10 Years.

EUROPEANS.

	1850-51.		1851-52.		1852-53.		1853-54.		1854-55.		1855-56.		1856-57.		1857-58.		1858-59.		1859-60	
Average Strength -	3,173¾		332		332		318		333		238		390		310		1,005		1,012	
DISEASES.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Fevers - - - -	213	—	197	—	121	2	164	3	291	1	309	1	334	2	139	2	128	1	628	2
Hepatitis - - -	22	1	21	—	17	2	41	—	18	2	52	1	24	1	22	1	6	—	49	2
Rheumatism - - -	23	—	30	—	31	—	31	—	37	—	25	—	19	—	—	—	25	1	55	—
Dysentery - - -	38	4	25	3	23	2	43	—	38	—	15	1	17	1	37	—	51	3	81	4
Cholera - - - -	1	1	2	1	—	—	1	—	—	—	—	—	2	2	1	—	—	—	17	10
Diarrhœa - - -	37	1	34	1	31	—	28	—	40	—	29	1	49	1	35	—	51	—	134	1
Syphilis - - - -	33	—	19	—	29	—	23	—	18	—	27	—	65	—	13	—	6	—	132	—

NATIVES.

Average Strength -	2,988		3,883¾		3,825¾		3,840		3,062		2,988		3,442		3,428		4,093		526¾	
Fevers - - - -	909	9	1,141	7	982	12	892	13	159	15	1,161	12	2,486	16	1,624	16	1,237	6	2,527	19
Hepatitis - - -	3	—	4	1	3	—	3	—	3	1	3	—	1	—	5	1	2	2	6	1
Rheumatism - - -	152	1	115	1	169	2	135	2	221	—	131	—	283	—	344	1	264	1	274	2
Dysentery - - -	22	2	5	—	17	—	14	2	71	3	36	2	71	2	72	8	36	21	67	5
Cholera - - - -	68	25	19	15	—	—	18	7	6	1	—	—	8	6	24	15	—	—	95	37
Diarrhœa - - -	51	3	49	1	63	1	54	1	59	1	98	3	112	2	156	1	85	—	126	2
Syphilis - - - -	48	—	41	—	26	—	39	—	13	1	46	2	59	—	107	—	120	—	140	—

XII. HOSPITALS.

1, 2. The artillery and British infantry hospitals are situated at the north-west extremity of the station near the bank of the Kanhan river. The infantry barracks are a mile distant from their hospitals, and the artillery somewhat less. The nearest bazaar to either hospital is 500 yards. There are walls round the hospitals 7 or 8 feet high, but the foundations are well raised. Ventilation is not obstructed by trees, except to the artillery hospital, which is very partially so. The site of these buildings is somewhat lower than the cantonment, and like all other localities in the station cannot be pronounced free from malaria. The infantry hospital is 100 yards from the bank of the river; the artillery 350 yards. Many ravines or small nullahs run near both hospitals into the river.

3. The supply of water from the well is abundant and good.

4. There is no regular drainage; there is, however, a gutter all round to receive the roof drippings, and the water from the bath-room is conducted outside in the same manner. There is no sewage for the privies.

5. The British infantry hospital consists of three buildings, one long building running nearly north and south, and two smaller ones branching off from either side of the long one at right angles. The wards are raised from 3 to 4 feet above the ground, but there is no perflation of air underneath. There is a gutter round the hospital, to receive the roof water, but it is not carried away, it flows into the hospital enclosure. There is no surface drainage. The walls of the hospital are of brick and are double, the verandah intervening between the inner and outer walls; the walls are sufficiently thick. The roof consists of a double layer of tiles, but it is not sufficiently thick to resist solar heat; it should be of thatch, with tiles over the whole. An inner ceiling has been recently added. The hospital is furnished with a verandah all round 10 feet wide; it has wooden doors and glass windows with jalousies all round. They are sufficient for shelter, but it is to be noted that the jalousies have been placed inside the glass windows instead of on the outside. The verandahs are used as reception rooms, there being no other. The hospital consists of one flat only.

TABLE of HOSPITAL ACCOMMODATION.

Total number of wards, 2.
Total regulation number of beds, 26.

Number of Wards.	Regulation Number of Men in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				No.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.						
Large ward - -	20	109½	18	15	29,565	1,505	108	1½	9	4¾	4¼
Small ward - -	6	35	18	15	9,585	1,505	108	1½	6 in Ward, 7 in the Verandah	4¾	4¼

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The hospital is so placed as to receive the full benefit of the prevailing winds. The windows open in the centre outwards. The arrangement is bad, there are means of regulating the ventilation and coolness; the jalousies open inwards. 6. The ventilation is effected by means of the doorways and windows in the verandahs, and by ridge ventilation in the roof, which latter has been recently added, but not, however, sufficiently. Entire ridge ventilation was proposed, but overruled by the chief engineer. The ridge ventilation in the small ward is insufficient. As before stated, the windows in the verandahs have jalousies, which open inwards and are placed inside the glass frames. The doors are of wood, and have no jalousies. 7. A thermantidote was supplied to the hospital for cooling the air during the hot months; but from its small size was quite useless. To cool the hospital efficiently several thermantidotes will be required, one is of no use. 8. There are no means for warming the wards. The walls, floors, and passages of the hospital are limewashed every week. The whole building inside and out can be whitewashed whenever required. 9. The hospital privy is placed behind the hospital at a distance of 24 yards from the nearest ward, and has a covered approach to it. It consists of a room furnished with open seats all round, the excrement remaining under the seats till removed by sweepers. It is not drained, and there is no water supply. It is washed out by hospital sweepers morning and evening, and then limewashed. The excrement is taken away morning and evening in covered carts to a distance of three-quarters of a mile from the hospital and deposited in pits. The privy is offensive; there are no cesspits. 10, 11. A new bathing house is now in course of construction in the hospital enclosure, which will be furnished with troughs, basins, and baths. Previous to this there was no proper lavatory arrangement. 12. All washing is performed by native servants supplied by the Commissariat. It is done outside away from the hospital. 13. There is no store at the hospital. The hospital stores are kept in a building at a distance under charge of the Commissariat department. The only store-room at the hospital is one for the medicines, and there is a part of the hospital verandah partitioned off. It is totally unfit for the purpose. 14. The hospital bedsteads or cots are of wood, with cotton tape bottoms; they are 18 inches from the ground, which is much too small a space. The bedding consists of two quilts of gingham, both lined and one quilted with cotton, one blanket, and two pillows; sheets are not allowed by regulation, except in dysenteric and fever cases. 15. The kitchen is situated behind the hospital opposite to the privy, at a distance of 19 yards from the nearest hospital wards. It is of the rudest construction. The fire-places are simply places in front of the back wall without flues. They are furnished with an oven. Ventilators have lately been put into the roof. The cooking utensils are of copper, and are tinned regularly once a month, which is found to be sufficient. There are no means of roasting meat, it must be baked or stewed. The cooking is well done as far as the means admit. 16. Copies of diet tables, diet rolls, &c., are transmitted. 17. The hospital attendance is as follows:—There is a hospital serjeant whose time is constantly occupied in attending to the discipline of the hospital. He superintends its cleanliness, and that of the patients, and is responsible that the diets are properly administered. There are no European nurses or orderlies allowed for male patients. The servants prescribed by regulation for an European regimental hospital are as follows:—1 European nurse; 1 head conocopoly or purveyor; 1 assistant conocopoly; 1 cook; cook's mate; 1 cooly maistry; 3 coolies for leeching, fomenting, &c.; 8 ward coolies; 3 sweepers; 3 toties; 2 water-carriers; 2 tailors, and 2 washermen. 18. The hospital is not in a good sanitary state, it is subject to malarious influences in common with the rest of the station; it is badly situated, being too low, and at too great a distance from the barracks; it is badly ventilated, and ill constructed. 19. There is no proper surgery or reception room for patients, the verandah is used for these purposes. There is no ward for lunatic patients, nor any ward sufficiently separated for the treatment of contagious diseases. The privy is a disgrace to the 19th century. It should be furnished with covered seats, under which should be placed metal troughs. The kitchen or cook-room should be reconstructed. There is no house near the hospital for the residence of a medical officer. The house nearest to the hospital in the lines of the 91st regiment is three-quarters of a mile distant. An assistant surgeon should reside close to all hospitals in India. 20. There is no provision made for the exercise of convalescents; men who are able to walk are allowed to do so morning and evening in the vicinity of the hospital under proper supervision. Those who are weakly and require change of air are sent out twice a day to the higher ground in a sick cart. This is a rough vehicle and ill calculated for convalescents. There are no shaded walks, or suitably fenced ground with seats. 21. There is no proper hospital for women and children of the European infantry at this station. One of the small sick wards has been used for that purpose, but is objectionable from being too close to the male hospital. Attached to the artillery force there is a separate hospital for women and children, which is sufficient, and the arrangements in every respect satisfactory. 22. There are no special local hospital regulations. 23. The surgeons of regiments have no power whatever to make repairs or improvements in the hospital, even those most urgent. He represents to the commanding officer what is required, and this is passed in regular course to the department of Public Works. The delay in carrying out improvements has been excessive. Surgeons of regiments are not allowed to alter the dietary; but there is but little inconvenience in this, as a suitable diet can always be obtained. The same remarks apply to camp and marches. 24. There are no convalescent wards; they would be of great advantage.
XIII. Burial of the Dead.	1. The burial ground is 1½ miles from the hospital of the European infantry regiment, and about the same distance from the artillery hospital, and beyond any influence from the prevailing winds.

KAMPTEE. MADRAS.

References to Subjects and Queries.	REPLIES.
XIII. Burial of the Dead —*cont.*	2. Its area is about three acres, the soil is soft, loose sand; there is no drainage. I cannot speak with reference to decomposition; the ground is tolerably well kept. 3. The grave space allowed is 7 feet by 3½, with an interval of 3 and 3½ feet. The graves are 6 feet deep, are never re-opened on any consideration, and one body only is interred in each. There is no fixed period for interment after death, but it takes place as soon as possible, generally from 12 to 18 hours. Hindoo graves are 6 ft. 9 in. by 2 ft. 3 in., with intervals of 4 ft. 6 in. between each. Mahomedan graves are 6 ft. 9 in. by 2 ft., with an interval of 1 ft. 6 in. between each. The depth of Hindoo graves is 4 feet for both sexes; and Mahomedans 3½ feet for males, and 4½ feet for females. One body only is laid in each grave for all castes, and the graves are never re-opened. Interment takes place from 10 to 12 hours after death, but sometimes sooner. 4. The graveyard has been known to be offensive during periods of epidemics. No other precautions are taken to prevent this, beyond having the graves dug further apart, and at different parts of the graveyard. There is no practice known as regards the burial of British troops beyond the usual military funeral. 5. There are three places for this cantonment for burning the bodies of Hindoos—all well outside. There are also three burying places for Hindoos, all at a good distance from the cantonment. The Mahomedans have six burial grounds in and around the cantonment. I am not aware of injury to health from the present practice. No bodies are allowed to be burnt near the cantonment. 7. Proper platform carts should be provided for carrying the corpses of the British soldiers from the hospital to the place of interment. The present plan is I think objectionable, viz., that of placing the coffin on a bier, or in a dooly, and carried to the burial ground by native coolies. Remark by the Commander-in-Chief.—My observations on all the foregoing points in reference to other stations, are equally applicable to Kamptee, and I have nothing to add to them. (Signed) P.G.

(Signed) C. A. BROWNE, Brigadier Commanding.
H. D. B. SMITH, Lieutenant, Executive Engineer Nagpore Division, D.P.W.
J. T. MAULE, Dep. I. General of Hospitals, N.F.

Kamptee,
25th January 1861.

Mem.—The whole of the replies entered in this report as by the Commanding Officer, are Major-General Carthew's.

VIZAGAPATAM, INCLUDING WALTAIR.

Accommodation — European Troops — Artillery - 140 at Waltair.
Infantry - 78 ditto. 92 Vizagapatam.
Native Troops - Artillery - 31.
Infantry - 847 38th M.N.I.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	(*Note.*) The topographical report on Vizagapatam must be noted under two distinct heads, viz., Vizagapatam and Waltair. The stations, though under one command, are 2½ miles apart, and at each there is a small detachment of European troops. The lines of the native infantry regiment are placed nearly midway between the two, at the north-east end of the town of Vizagapatam. In the fort of Vizagapatam is stationed a company of European veterans, the arsenal, garrison hospital, medical stores, and commissariat establishment and pay office. At Waltair are the telegraph office, residences of the general commanding the division, and all officers belonging to the native infantry regiments, and European detachment of infantry and artillery, also a small bazaar. 1. Both stations are sheltered on the north, south, and west by a low range of hills, distant from 1½ to 6 or 7 miles, and about 500 to 600 feet high. Between Vizagapatam and the hills is a tidal marsh of some considerable extent. Between Waltair and the hills is a cultivated valley, free from jungle and undergrowth. 2. Vizagapatam is about 10 to 15 feet above the sea. Waltair is on sand hills from 150 to 200 feet above the sea, and about 150 feet above the adjacent country. A tidal marsh and back water lies to the west of the town and fort of Vizagapatam. The fort is open to the sea on the east and south east. There is no higher nor healthier ground nearer than Waltair, which is well situated. 3. The nearest mountain range is the "Vindhyan," distant about 50 miles in a straight line. Estimated height from 4,000 to 5,000 feet above the sea. 4. The sea is close to Vizagapatam and Waltair. The marsh and back water before alluded to, near Vizagapatam, and there is a small stream down the cultivated valley, between Waltair and the hills. There is no overflow of water, save from the tide, in the marsh. The sand-hills near Waltair are broken up into deep open ravines, but all clean and dry sand. No effect on health. 5. Both stations are clear and open. Unencumbered by trees, hedges, or gardens. Ventilation not interfered with by vegetation. Prickly-pear is in process of clearance. Vizagapatam town is rendered very hot, and so are the native infantry lines, by reflected heat from the sand-hills, which shut out the sea-breeze. The fort of Vizagapatam and station of Waltair are sheltered from the land winds, but well open to the sea breeze, from which the town of Vizagapatam and the native infantry lines are shut out. The sea breeze is most healthful and refreshing, but the southerly winds are not so. They are found to be relaxing and debilitating in their effects on the constitution.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	6. The surrounding country is fairly well cultivated. There are no works of irrigation near either station. There are a few paddy fields in the valley near Waltair, which have no appreciable effect on the health of the station. The cultivation of rice is neither prohibited nor restricted. Indigo, hemp, and flax are not cultivated near the station. 7. The town of Vizagapatam lies N.E. of the fort, and close to it. Vizianagrum, 30 miles distant, is the nearest large town. 8. Between the town of Vizagapatam and the hills is a considerable alluvial deposit. The remaining subsoil is sand and gravel. The hills are broken volcanic rocks, with deep sand. Waltair had not been previously occupied. The fort of Vizagapatam is a very old station, and dates back to the days of the Dutch. 9. Water is scarce. Wells are from 25 to 30 feet deep, where excavations are stopped by hard rock. In the dry season the wells are frequently dry, and not over-abundant in the rains. 10. The rainfall generally flows away readily, especially about Waltair, except in one spot called the washing green, which is apt to retain both rain water and surface springs. This spot is but little above the level of the sea. The parade ground of the native infantry regiments is on a level with the swamp at Vizagapatam, and in wet weather is poachy and soaked with water. The hospital is on the same level. In these localities the water lies on the surface till it evaporates. The drainage from the hills passes into the valley and swamp; but is rapidly carried off to the sea, and does not pass through the stations. 11. The water supply of the station is derived from wells. There are three small tanks within the station, the water of which is used for garden purposes and for cattle. The tanks are generally dry from February to June. They contain neither plants nor animals; some animalculæ. No tank for drinking purposes is used for bathing. The well water is clear and good. The tank near the native infantry parade ground is very foul and bad. Bad as it is, it is most useful, being near a halting place for bullocks, camels, elephants, &c. A general resort for all travellers. Two good wells are close to it, which supply good drinking water. No foul drainage into this tank, but plenty of leaves. No other nuisance from tanks near the station. 12. The water supply at present is very limited, and not more than meets the present wants of the inhabitants, military, civil, and native. No colour, taste, or smell. It is good, clear, and wholesome. Water is raised from the wells by rope and hand. It is supposed that an unlimited supply might be brought in iron pipes from hills distant about 4 or 5 miles. 13. The fort and town of Vizagapatam are singularly ill placed in every respect, and yet few places are so free from epidemics. The native houses crowd too near the fort, and if practicable these should all be cleared away, so as to leave an open space of about 100 yards. Both in a military and hygienic point of view, this would be most desirable. These houses abound with prostitutes and illicit sellers of bad arrack. 14. As regards the selections of new stations: The new sanitarium on the hills about 60 miles from this, was selected by a committee of officers:— Inspector-General of Hospitals, Superintending Surgeon, Garrison Surgeon, and Deputy Assistant Quartermaster-General, who made every practicable inquiry and examination as to climate, diseases, sanitary condition of villages, and residents on the hills, and on their report the place is under trial. The committee suggest no improvement on this system.
II. Climate.	1. The meteorological instruments at this station are in the jail hospital, and consist of an Aneroid barometer, thermometer, and pluviometer. 2. The following is a meteorological table from January to December 1859:—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Min.	Mean Sun Temp.	Rain, Inches.	Winds. Direction.	Days of Sunshine.
January - -	29·91	73·5	4·5	75·5	71·	91·	0·6	N.E. & E.	30
February - -	29·93	76·5	3·5	78·	75·5	90·	1·	N.E. & S.E.	28
March - -	29·87	83·	3·5	85·5	81·	88·	0·65	S. & S.E.	27
April - -	29·80	88·5	6·5	96·5	90·0	102·	0·65	S.E. & S.W.	30
May - -	29·64	87·5	2·5	88·5	86·5	99·	2·05	S.W.	30
June - -	29·58	87·5	3·5	89·	86·5	75·	3·3	S.W.	21
July - -	29·71	85·5	3·5	87·5	84·5	54·	5·25	S.W. & W.	17
August - -	29·72	86·	2·	87·	85·	55·	5·	W.	17
September - -	29·79	85·	2·5	86·5	84·5	61·	6·2	W. & N.E.	19
October - -	29·91	84·	3·5	85·5	82·5	86·	11·	N.E.	27
November - -	30·04	80·	4·	82·	78·	76·	3·	N.E.	25
December - -	30·06	76·	2·	77·	75·	84·	0·10	N.E. & E.	29

Remarks.

January.—The temperature is at the lowest about the 10th, the wind being generally from the N.E., veering towards the east and S.E. The minimum temperature is 60°. Heavy dews. Weather serene. Thunder and lightning almost unknown.

February.—Not so cold as January, though pleasant. Heavy dews and occasional fogs throughout the month. The sky very clear, no rain nor lightning. Wind N.E., with frequent changes to the S.E.

March.—The along-shore, or S.E. wind, sets in during the month, and renders the air damp and sultry. Sky continues clear. Little or no dew.

VIZAGAPATAM, including WALTAIR. MADRAS.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	*April.*—Wind towards the end of the month changes to the S.W., and blows with considerable violence. Dew and rain are almost unknown. *May.*—The S.W. winds continue with heavy gusts throughout the month. Land winds blow for about 3 days in the month, and usually alternate with the sea breeze. *June.*—The S.W. rains begin to set in about the first week, and become more frequent towards the end of the month, and the sky is generally cloudy. *July.*—Rain more abundant than in last month. Wind from the same direction. Large masses of flying cloud seen in every direction. No sea breeze. Lightning and thunder occasionally. *August.*—Wind more westerly and rains are heavier. Thunder and lightning occur more frequently. The heat is much reduced, but calms peculiar to the month are very oppressive. Continues cloudy. *September.*—The wind, rain, and appearance of the weather continue the same as in August, until about the 15th, when the N.E. rains set in partially, and become heavy towards the end of the month. Thunder and lightning are frequent. Oppressive calms still continue. *October.*—North-east rains continue with great force throughout this month. The wind blows very fresh, sometimes amounting to a gale, and veering in every direction. Thunder and lightning occur frequently. The clouds assume a heavy appearance. Becomes cool towards the end of the month. *November.*—Rains cease about the middle of this month. Thunder and lightning seldom occur. The sky assumes a clear and serene appearance, and the weather becomes pleasant. *December.*—Wind still from the N.E. and E. The sky has a clear and tranquil aspect. Rain and lightning are seldom known, but towards the latter end of the month heavy clouds are often seen. 3. The climate is healthy; rather relaxing. In the north-east monsoon it is dry and mild. In the south-west monsoon the air is damp and muggy. Heat is never very great, nor is the cold. Thermometer rarely seen above 92°, and seldom below 70° in the cold season. Land wind almost unknown. Sea breeze very constant. Daily variations of thermometer very slight. European troops should be very healthy as far as regards the climate, if properly clothed, and prevented from indulging to excess in liquor, the great source of disease at this station. Flannel should be always worn, light dress in the hot, and warm woollen costume, of loose make, in the cold and rainy season. Exposure to sun should be avoided, and also to the night air. Late drills objectionable on account of the sun. With the exception of August and September, the whole year may be considered as pretty healthy. In these two months fever of the remittent type frequently prevails. In April and May sunstroke is not uncommon among the Europeans. 4. During the past year a spot on the Vindhyan range, about 60 miles from the station, has been selected as a sanitarium (named Galee Kondah, in Teloogoo "Hill of wind"). The elevation is about 5,000 feet above the sea, with a fine fresh air and cool climate, open to the sea breeze. Thermometer from 10° to 15° lower than at Vizagapatam. The spot is fairly open, and free from jungle, among a range of well-cultivated valleys. Good water. Thus far no fever or other epidemic has appeared among parties sent up to explore, and who have been for some time resident on the hills, but a fair trial has only now commenced. 5. As regards the comparative healthiness of different stations:—Colonel Pooley has served at Kulladgee, Dharwar, Ellore, Burmah in the first war as far as Jandaboo, Musulipatam, Berhampore, Northern Circars, Nagpore, Bangalore, French Rocks, Jubbulpore, Saugor, Nagpore, Vizagapatam, and Singapore. Of these stations Bangalore, French Rocks, Jubbulpore, and Saugor were the most healthy. The worst Nagpore, and, if possible, Singapore worse still. Dr. Smith has only served at Bangalore, and thinks highly of the climate. Captain Blagrave has served at Mercara, Madras, Rangoon, Pegu, Bellary, Kurnool, Berhampore, Russelcondah, Chiencole, Vizagapatam, and Vizianagram. Of the above, Mercara and Vizagapatam appeared the healthiest, the former much the most so.
III. SANITARY CONDITION OF STATION.	1. Map transmitted. 2. There are no covered drains or sewers in the fort or at Waltair. The majority of the drains in the town, under the Municipal Association, are open V-drains. There are no cesspits, dungheaps, &c., allowed in the fort. All refuse is thrown into the sea daily. 3. Plans of barracks. 4. The following table gives the barrack accommodation:—

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Breadth.
European Vet^{n}. Co. Barrack.	72	141	22	13	40,326	$560\frac{1}{12}$	$43\frac{1}{12}$	$1\frac{1}{2}$	32	4	$2\frac{1}{2}$
European Temporary Barrack, No. 1.	52	154	18	15	41,580	$799\frac{8}{13}$	$53\frac{4}{13}$	$1\frac{1}{2}$	20	3	3
Do. No. 2	52	155	18	15	41,850	$804\frac{2}{26}$	$53\frac{7}{26}$	$1\frac{1}{2}$	20	3	3
Do No. 3	56	164	18	15	44,280	$790\frac{5}{7}$	$52\frac{5}{7}$	$1\frac{1}{2}$	22	3	3
Do. No. 4	52	158	18	15	42,660	825	$54\frac{9}{13}$	$1\frac{1}{2}$	20	3	3
Do. No. 5	48	140	18	15	37,800	$787\frac{1}{2}$	$52\frac{1}{2}$	$1\frac{1}{2}$	18	3	3
Married Men's Quarters	11 families	132	17	15	33,660	3,060	204	—	11	3	3
Guard Rooms	4	23	15	9	3,132	783	$86\frac{1}{4}$	$1\frac{1}{2}$	3	$3\frac{1}{2}$	3
	15	44	13	12	6,864	$457\frac{9}{15}$	$38\frac{2}{15}$	$1\frac{1}{2}$	10	4	$2\frac{1}{2}$
	8	32	13	11	4,576	572	52	$1\frac{1}{2}$	4	4	$2\frac{1}{2}$
	24	24	9	9	1,944	81	9	None.	3	$\frac{1}{2}$	3
Prison Cells	1	8	8	11	704	70	64	None.	4	$1\frac{1}{2}$	6
	1	8	8	11	704	704	64	None.	4	$1\frac{1}{2}$	6
	6	18	12	11	2,376	396	36	$1\frac{1}{2}$	4	$1\frac{1}{2}$	6
	1	8	8	11	704	704	64	None.	2	4	3
	2	16	8	10	1,280	640	64	None.	4	$1\frac{1}{2}$	6

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides of the barrack rooms. They are opened and shut by propping up or letting down a piece of matting in Waltair temporary barracks. In the fort the windows are also on opposite sides, and open outwards with iron bars. There is an open verandah 9 feet wide round both barracks. These verandahs are never occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils. There are shutters outside in the fort which fasten inside, and consequently impede ventilation. 6. The bedsteads at Waltair are all of wood, others have wooden frames with strings interlaced across. Bugs abound in all barracks and infest beds to a great extent, so much so that the men suffer more from them than from heat or bad ventilation. The use of iron bedsteads would almost, if not entirely, free the soldier from this great discomfort. A coat of paint annually would preserve the bedstead from rust, and they would ultimately prove much cheaper. In the fort iron cots are used, and bedding of 1858–59. In tents cots are not used. In damp weather straw is issued on the certificate of the medical officer. The straw is thickly spread on the ground, and on it the men spread their carpets. 7. There are two descriptions of tents used for troops. The dimensions of the one for European soldiers are (within the fly) 21 feet by 15 feet, cubic contents 2,194¾ feet, superficial area 315 feet. Each tent is supposed to hold 25 men. The tent used for the natives is bell-shaped, and holds 25 men; dimensions within 22 feet by 12 feet, cubic contents 1,434 feet, and superficial area 264 feet. 8. The following are the means of ventilation in use:—In the temporary barracks at Waltair the walls do not extend up to the roof. This causes better ventilation than in most other barracks. The officer commanding detachment 2nd European Light Infantry, says, that at Bangalore, Secunderabad, Fort St. George, and Trichinopoly the air at night is exceedingly foul. In the fort barracks no upper ventilation except two Venetian windows, one at each end, east and west. The men prefer the temporary barracks at Waltair to all permanent ones, as being more airy. Tents are ventilated by raising the walls. The ventilation at Waltair is perfectly sufficient to keep the air pure day and night. In the fort not so. The barracks are low and very hot; bomb-proof buildings. There are no means of cooling the air, neither are any requisite at Waltair. In the fort punkahs are used, at a cost to Government of 25 rupees a month. 9. The materials of which barracks and tents are made are as follow:—At Waltair the walls are wattle and dab, with palmirah posts at intervals; brick pillars to verandahs; thatched roof. In the fort, brick, stone, and mortar. Tents are of cotton cloth; four plies thick, inner one blue. 10. At Waltair the flooring is of earth, about 2 feet above the level of the ground. Fort, stone, not raised above the level of the ground. No passage for air beneath. 11. The temporary barracks at Waltair are much liked by the men, and are very suitable to the climate, and very cool and healthy. In the fort, hot and close; objectionable in every way. They should be entirely rebuilt in a more modern form at Waltair, or out of the fort, certainly. Tent material, good. Barracks repairs are executed by the engineers and public works department on a requisition from the deputy assistant quartermaster general, under the orders of the officer commanding the division or brigade. The officer commanding the cantonment is responsible for its general sanitary state, and officers commanding regiments and detachments for the portions under their immediate command. Cleansing and whitewashing is done on the requisition of the commanding officer when requisite. 12. Sketch of wash-houses. 13. Cooking is done at the ordinary cooking brick fire-places, by boilers and frying pans. Water for the purpose is drawn from wells by puckallies. The small quantity of refuse water from kitchens is dried up at once by the sun's rays. Washing is done at washing and drying greens near the sea by the dhobies. Quite sufficient. 14. For privies, tubs are used which are carried away and their contents emptied into the sea daily. 15. These buildings are ventilated on the same plan as the barracks. Barracks and privies at Waltair are lighted at night by oil lamps, on stands about four feet high. In the fort, by globe lamps. 16. The barrack drainage, such as exists, is by means of open surface drains either into the sea or the backwater; the distance in either case being under 200 yards. At Waltair the barracks and outbuildings all stand on high ground with a slope, and the water runs off rapidly. In the fort it sinks into the subsoil. From the privies and urinals, there is no drainage, being in tubs. From the baths by small open drains. At Waltair, no part of the barrack is damp. In the fort, heavy rain when sufficiently continued to soak through, causes a little dampness in the roof of the barracks. At Waltair the drainage is sufficient. In the fort, the fluid is cleared away by the barrack coolies. As far as practicable, chunam is spread over it at intervals. The remainder soaks into the ground or evaporates. There are no cesspits. At Waltair there is a large foul ditch in the bazaar, but not affecting the barracks, being about 500 yards away, used by the natives as a necessary. In the fort, none about the barracks, but one or two bad drains near the hospital. These are being improved by the municipal association. 17. The town is kept clean by the municipal association. The fort is badly off in this respect, and seems to be under no efficient management. Waltair is so open as to require but little cleansing, and what it does require is done under the orders of the magistrate. 18. The surface of the cantonment is being cleared of prickly-pear, the only vegetation that crowds it in some places, and which has been allowed to overgrow it to such an extent as to endanger the health of the troops. There are no old walls or thick hedges which interfere with the ventilation of the station, bazaar, &c., requiring removal. 19. As regards general sanitary condition, the cantonment is so open that no cleansing is required. The bazaar and town are kept clear by the municipal association. The larger streets are fairly swept and clean. Open drains with stone sides and bottom in the form of the letter V are being made, and the drainage carried off in the direction of the tidal marsh. The town sweepings are carried off to some distance in carts. Public cloacæ are in process of erection. The supply of water is from wells, not over abundant; what there is, is good.

VIZAGAPATAM, including WALTAIR. MADRAS.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	The houses of the poorer classes, chucklers, fishermen, &c., are too much crowded, but generally speaking the town is good and open. Some huts between the back wall of the hospital and the marsh should be removed. There are large heaps of filth near the fishermen's huts, near the fort, which should be cleared away. The cleansing of the bazaars and town is entirely in the hands of the municipal association. Dung heaps and cesspits among the native houses are in process of removal. The greatest possible nuisance is experienced at times in consequence of the fishermen salting and drying their fish on the beach, and also from the state of the drains in the fort. The former can only be stopped by removing the fishing village from its present position. But as the fishermen are also boatmen, any removal would be attended with great inconvenience to the shipping interest. It will be better to remove the troops from the nuisance than the nuisance from them, and to remove the barracks up to Waltair. 20. Animals are now slaughtered at about two miles from the town, near the sea between Vizagapatam and Waltair. All this is fairly well managed by the municipal association. 21. Camels, elephants, bazaar horses, bullocks and carts, camp in a cocoa-nut tope close to the native infantry lines. All this is too crowded, but there is no other convenient spot near. It is a perfect nuisance to the native infantry regiment. 22. Artillery horses are picketed on open ground at Waltair, clear of the barracks and hospital. 23. No married men occupy barrack rooms. All live in detached houses in the patchery, for which they have to pay rent in the fort. In Waltair temporary barracks, a building divided into separate rooms is set apart for married men, who have also a washhouse and necessary outhouse to themselves. *Officers' Quarters.*—Officers live in detached bungalows, and, except one or two who live in the fort, are very comfortably housed. The bungalows in the fort are close, ill-ventilated, and offensive at night from the drains. Nothing will improve the houses in the fort.
IV. HEALTH OF THE TROOPS.	1. The station is healthy, and the native population are a healthy race. Fever is occasionally prevalent; it is the disease of the district; more common in the interior than on the coast, especially near the hills. 2. The diseases most prevalent among the native population are cholera, small-pox, chicken-pox, fevers of intermittent and remittent types; rheumatic affections, beriberi, lepra, elephantiasis to a great extent in the town of Vizagapatam; elephantiasis of the scrotum and testes, also hydrocele. 3. Fevers appear to depend on the westerly currents of air from the jungles under the hills. 4. The previous stations of the troops have been as follows:— The detachment 2nd E.L.I., Trichinopoly; were there six months; left 27th September 1858. The officer commanding the detachment is not able to state what diseases they suffered from there; were in good health on arriving here in the end of October 1858, and have continued in excellent health since. The men in the fort are veterans, invalids from every station in Southern India. The 38th regiment M.N.I. came here from Singapore, where they had been for three years. They left Singapore in February 1858, and landed the same month; the men, worn and emaciated, having suffered greatly abroad from diarrhœa, atrophy, and ulcers, all indications of a low state of the circulatory and nervous systems; and the diseases they have suffered from here have in a great measure resulted from the effects of a foreign climate. As regards the comparative healthiness of different parts of the station, the fort of Vizagapatam for European veterans and the native infantry lines are both objectionable. 5. The troops at this station are never camped out. 6, 7, 8. (Hill stations.) No experience. 9. As regards diseases, troops, on first going to hill stations, are liable to congestive fevers. The men, at once freed from the restraint of the plains, and the debilitating influences of hot stations, are apt to be constantly out in the sun, and suddenly take a large amount of exercise to which the constitution is not inured, and for which it is not prepared. The appetite is also greatly increased, and often in excess of the power of assimilation, or the demands of the constitution; perspiration is greatly decreased, or altogether stopped, and the kidneys do not at once respond to the sudden demand made on them, and the consequence is congestive fever. 10. The obvious remedy for this state of matters is to limit the amount of exercise and food at first, and keep up a free action on the skin with warm clothing. 11, 12. No experience. 13. Men leaving the hills should on no account be suddenly exposed to the sun or to very long marches. They will feel the debilitating heat of the plains at first. March them at night, do not harass them with guards or hot dress, and avoid stimulants. 14. As regards the advantages of locating troops on hill stations, the loss of European life on the hills will be found to be less than on the plains. There can be no objection, so far as health is concerned, in locating troops on the plains, with an occasional visit to the hills, to restore health lost in the plains. As regards the effects of frequent change of station on the plains, for troops, it is simply ruin to the sepoy in every way, most depressing to their spirits, and harassing. The risk of cholera or any other epidemic on march is very great, and the men on the Madras side are ruined in pocket by constant marches with their families, who always accompany them; and consequently, being half fed, are more accessible to attacks of disease, and succumb to them more readily. It is very painful to see the effects of foreign service or a long march on the health of a native regiment. The men are prematurely aged and broken. The climate of Burmah, the Straits, and China ruins the health of men. A less frequent change of station is desirable. 15. (Nature of barrack and hospital accommodation at hill stations.) No experience. 16. (Best elevation for hill stations.) No experience. 17. Answered under "Climate," No. 4. 18. As regards the healthiness or unhealthiness of particular soils; red soils, gravel, and sand, with a free drainage, are generally healthy; black and saline soils are generally unhealthy. 19. The best age for soldiers proceeding to India is from 19 to 22 years. The best time for their landing in India is the cold season, November to February. On arriving at Madras, artillery recruits are marched to the Mount, nine miles off, in a hot sun. Infantry recruits are sent by rail to Arcot, whence they are drafted into different regiments, and in three or four weeks are marched to their station, where they at once com-

References to Subjects and Queries.	Replies.
IV. Health of the Troops—*cont.*	mence a course of drill. The artillery should by all means be saved the first hot march to the Mount, most trying to young men, just off a long sea voyage, clothed in broad cloth. They should be sent up in transit carts, and for all recruits provide suitable barrack accommodation, temperance rooms, and means of amusement, as backgammon, dominoes, chess, bagatelle, a library, skittles, quoits, and other manly games; a workshop for tradesmen and others, anything to occupy the men and keep them from the canteen at starting in life. 20. As regards intermediate stations before arriving in India, no advantage could be gained by sending troops to such stations, and many disadvantages. They come out with habits of industry, which might be lost. If hill stations are available where the troops are landed, it is better to send them there at once. 21. Answered under paragraph 19. 22. A soldier may serve in India from 15 to 20 years, if after 10 or 12 years' service he had a change to the hills. 23. With reference to the present working of medical boards, these boards agree on important questions. Differences of consequence do not often arise. 24. Invalids should leave India after the cold season, and reach England in May or June.
Diseases.	1. Inspection parades for the discovery of incipient diseases are not usual at this station. Men who have an object, or wish to conceal disease, can do it so easily that these parades are not often useful. 2. Neither scorbutus nor scorbutic disease ever appear at the station. 3. There is very little hepatic disease at the station. A few chronic cases exist among the veterans, but none dependent on or resulting from local causes. 4. Dracunculus is not common at the station. 5. There is not much venereal disease. What there is, is of a mild character, chiefly gonorrhœa. The proportion to the total sick in hospital from all other diseases is 6·244 per cent. It must be borne in mind that a large proportion of the veterans are married men, and that most Madras sepoys are married. The question of lock hospitals is an important one. At most stations the civil dispensaries meet the want, and women of the town for their own sakes would resort to them for cure. The surveillance of these women by the police in India is most objectionable, and liable to the greatest abuse. The police peons for a trifling bribe would let any women off, however diseased, and with these views we see nothing to be gained by the establishment of lock hospitals, seeing that all their requirements are met by the civil dispensaries. 6. No epidemic has prevailed for some years. The only endemic disease, if it may be so called, is *erythismus tropicus*, cases of which are not uncommon from April to June. They chiefly come on at night, from 8 p.m. to midnight, and are not unfrequently the result of unusual exposure to the direct rays of the sun. In most cases there is found more congestion of the lungs than of the brain. *Fevers.*—Fevers are not uncommon, chiefly an aggravated form of quotidian, with some congestion of the brain, which is occasionally fatal. *Dysentery.*—A detachment of H.M. 69th regiment in 12 months lost a good many men from dysentery in 1858. Seven or eight cases out of 200 men in 10 months. The men were new to India, and suffered from toddy and bazaar liquors, also from exposing themselves at night. A detachment of the 2nd European L.I., a Madras regiment, relieved them, and occupied the same barracks and hospital, and not a case of dysentery has been fatal among them. *Cholera.*—No epidemic for 2½ years either in Waltair or Vizagapatam. *Small-pox.*—Occasionally appears in the hot months; the disease is much subdued and modified by the extension of vaccination. *Rheumatism.*—Is common, and chiefly during the presence of the south-westerly monsoon, when the air is loaded with moisture. The following table shows the proportions which the admissions and deaths from these diseases bear to the total admissions and deaths:—

Diseases.	Total Admissions. All causes.	Admissions from each Disease.	Deaths from each Disease.	Per-centage of Admissions to Total Admissions.	Per-centage of Deaths to Total Deaths.
Fevers - - - -	—	96	2	8·759	8·333
Small Pox - - -	—	19	1	1·733	4·166
Cholera - - - -	—	4	1	·364	4·166
Dysentery - - -	—	23	1	2·098	4·166
Rheumatism - - -	—	166	2	15·145	8·333
All others - - -	—	788	17	—	—
Total - -	1,096	1,096	24	28·099	29·164

	7. The most frequent zymotic diseases are fevers, cholera, and small-pox. They are most prevalent at the commencement of the hot season. No atmospheric changes remarked which precede or accompany their appearance. As regards the condition of the native population among whom these diseases are most prevalent:—The sanitary state of the bazaars occupied by the dwellings of the lower orders, viz., fishermen, chucklers, and pariahs, is very bad, and, though in process of improvement by the municipal association, is never likely to be good. The houses are crowded, and the habits of the people filthy and offensive. The native troops are located in a most objectionable spot, shut out from all sea breeze, and under a high sand hill to the east or sea board, on which the pauper dead were buried. To the north they are pressed in by a densely populated native village, occupied by potters, oil mills, and chucklers. To the south the halting place for camels, elephants, carts, and travellers. To the west a large and close garden. The means of ingress and egress are through narrow water-courses, in the monsoon often ankle deep, and in case of fire rendering escape difficult. It is a wonder that epidemic disease is not more common. 8, 9. As noted before, epidemic diseases are not common. Small doses of quinine, as a prophylactic, are unnecessary. 10. Epidemic disease at the station would be mitigated by cleanliness, a more abundant water supply, a more free circulation of air through the crowded parts of the bazaars and lines.

Vizagapatam, including Waltair. Madras.	References to Subjects and Queries.	Replies.
	V. Intemperance.	1. The officers commanding European troops at both stations report the men temperate, with few exceptions. The strength of the detachment 2d European Light Infantry at this time is 77, out of which number there are only three confirmed drunkards. In the European Veterans the proportion of confirmed drunkards is 10 per cent. 2. The proportion of admissions into hospital *directly* caused by intemperance in the detachment of 2d European Light Infantry and European Veterans is from *ebrietas,* 21·630; *delirium tremens,* ·729 per cent. There are no means of showing the proportion of admissions *indirectly* caused by intemperance, or the effect of intemperance on disease, mortality, and crime. Drunkenness *per se* is punished as an offence. 3. Spirits are sold at the canteen, and a worse description of liquor is sold to the men within a few yards of the barracks. That which is sold in the bazaars and about the country is not only bad, but occasionally of a most deleterious nature. No estimate can be formed of the amount consumed per man per diem. It depends not only on their inclination but their means. A dram of arrack and a pint of beer, or two drams of arrack only, daily, is purchaseable from the canteen. Government do not provide the men with spirits as part of their ration, but they are allowed to purchase it at the canteen. Spirits are not sold till midday except on the march and in the field, when those who can afford it take a dram directly they reach their camping ground; a custom that is decidedly injurious to their health, to drink spirits at so early an hour. An issue of coffee on the march is far preferable. Under the order of the medical officer, wine, beer, or spirits may be ordered for convalescents. These are all obtained from the commissariat, and are of good quality. The quantity is at the surgeon's discretion. No drinks other than intoxicating drinks, injurious to health, are sold in the canteen. Deleterious liquors are sold in the native shops. 4. The officer commanding detachment 2d European Light Infantry says that the use of spirits is not necessary, but, if restricted to the quantity a soldier is permitted to purchase in the canteen, he does not consider it is injurious. The surgeon differs altogether from this opinion, and considers it most injurious to the health. The habitual daily two drams ruin the health and habits of the soldier, who thinks that as long as he takes only what the Government allow him he cannot go wrong. The consumption of spirits, under the restrictions contained in the foregoing answer, would have no effect on the efficiency or discipline of the regiment. 5. As to restricting or abolishing the use of spirituous liquors:—The officers commanding European troops at both stations say, they would recommend a continuance of the present custom of allowing men to buy a certain quantity of spirits in the canteen, but it would be most beneficial to abolish the use of it elsewhere. The surgeon is of opinion that the sale of spirits should be altogether discontinued by Government. The men assume that Government considers two drams necessary, or they would not be allowed, and if so, what great harm in a third dram or a fourth, and so it ends in a fit of drunkenness or worse. The habit of spirit drinking which the Government system establishes is what should be avoided. 6. As regards the comparative influence on health of the use of other liquors, the officer commanding detachment 2nd European Light Infantry says, that he does not think the men would purchase wine, and that a moderate allowance of malt liquor is of advantage to the health of most men in India. 7. Coffee is sold within the barrack limits of the Europeans, and is freely purchased. Unquestionably the use of tea and coffee would be beneficial, and the health, efficiency, and discipline would be materially improved by tea and coffee being consumed in preference to spirits and malt liquor, as has been proved when neither spirits nor malt liquor could be procured. 8. It would be beneficial to suppress the sale of spirits by Government altogether, and to substitute a larger sale of beer with tea and coffee; but many of the men are so partial to spirits that, if none could be obtained in the canteen, they would wander all over the country in search of it, and pay anything for it, and they would get bad and unwholesome spirits sold to them. 9. Answered above. 10. The officer commanding the detachment 2nd European Light Infantry says, that he would recommend that the soldiers be compelled to receive the spirits purchased in the canteen diluted with water, as he believes is done in some ships with sailors, and he sees no reason why so excellent a system should not be introduced among soldiers. To this the Committee subscribe, as one step to the total abolition of spirit drinking.
	VI. Diet.	1. The ration for European troops of the Indian army at the station is as follows:— Bread - - - - 1 lb. | Tea - - - - $\frac{5}{7}$ oz. Meat - - - - 1 lb. | Coffee - - - - 1$\frac{3}{7}$ oz. Rice - - - - 4 oz. | Vegetables - - - 1 lb. Sugar - - - - 2$\frac{1}{2}$ oz. Coffee is issued twice a week, and mutton twice. The rations are inspected previous to issue by the officer of the day. 2. A complete ration, including vegetables, but no fruit, is issued daily. The amount of stoppage is 3 annas and 4 pice. The meals are, breakfast at 8 A.M., dinner at 1 P.M., and tea at 5 P.M. Vegetables constitute about a third of the ration. 3. The officers commanding the detachment 2nd European Light Infantry says that the men would like, and he thinks that it would be beneficial, that they should have, when procurable, a larger allowance of vegetables. There is no inclination on the part of the men to sell their rations. 4. The cooking apparatus consists of common brick places for holding the boilers. Frying pans. The kitchens are kept clean, and are sufficiently lighted and well ventilated. The food is both boiled and roasted. The rations are well cooked, and tea and coffee are well prepared. In the 2nd European Light Infantry those men who have money can buy coffee before starting on march. Just before daylight the regiment is halted for a quarter of an hour, when each man receives a pan of coffee and a biscuit gratis. It is paid for by the canteen fund.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	5. Soldiers' gardens should be under the control of the commissariat; volunteers of good character being struck off duty as gardeners with a trifling monthly pay, and the whole of the produce of the garden to be divided daily amongst the messes.
VII. Dress, Accoutrements, Duties.	1. The soldier's dress at this station consists of a red jacket or Khakee tunic, cloth or cotton drill trousers, according to the season; pouch and waistbelt. The red jacket is a very inconvenient dress for men on duty. Whilst on sentry it is not so uncomfortable. But when lying down to sleep it is hot, uncomfortable, and too much confined. The Khakee tunic might be worn at all seasons in the plains of India, with the aid of the great coat when requisite. It is most desirable that the men should always have English boots. A single morning drill, if there is much dew on the ground, will almost destroy a pair of country boots. The men wear red jackets in cold weather, with cloth trousers. Linen jackets and trousers in hot weather. If a sentry's post is exposed to sun or rain, it is protected by a pandal. A cloak would be useful in bad weather, and for warmth on the hills, and a cooler and more easy style of dress, advantageous on the plains. The present red cloth jacket is unsuited to India. The men's constitutions become debilitated by the constant drain of excessive perspiration.
Duties.	1. A soldier should complete his drill before leaving England, as recruits have drill three times a day, which is harassing to them. 2. When a soldier joins a battalion, the amount of drill is usually very small, about four mornings in the week for an hour or an hour and an half. He is usually on guard every four days, and has nothing more to do except answering his name at the usual roll-calls, and keeping his arms and accoutrements clean. The men do not suffer in health from such drills, unless kept out late in the sun. No drills, parades, or marches should continue after half-past seven. But there are no general orders on this subject. The number of nights a man has in bed per week is dependent on the station and strength of the regiment, but taking a man's usual service, he has four nights in bed and one out. 3. Guards are mounted within one hundred yards of the barracks. Guards are on duty for 24 hours. Sentries relieved every two hours. Roll-calls for Europeans take place at 5 a.m., at breakfast time, at 9 a.m. for cleaning arms and accoutrements, at dinner time, and at 5 and 8 p.m. A check roll is called during the night, but this does not disturb the men. The regimental orderly serjeant goes through the barrack rooms with the orderly serjeant of the company, and sees that the men are all in their cots. For natives there is roll-call every morning, when there is no drill, and every evening. No additional precautions are requisite.
VIII. Instruction and Recreation.	1. There is no ball court. There is a skittle-ground at Waltair. There is no school at Waltair, but there is a trained schoolmaster at Vizagapatam. There is a library at regimental head-quarters, 2nd European Light Infantry; not with the veterans. There is a garrison library, from which men at Waltair and Vizagapatam get books. There is no day room. There are no soldier's gardens; some were assigned, but they failed to keep them in order; the gardens also failed for want of water. There are no workshops, theatre, or gymnasia. If all these places were kept up, they would be ample. Workshops would be of great service, but none have ever been established. In the fort there is no place of recreation but the canteen. The want of such places is much felt by the men. There is no restriction to the men exposing themselves to sun and rain when off duty. The result to health is often very prejudicial. 2. The means of recreation enumerated above would be ample. 3. The present savings' bank system is sufficient. 4. There is no shade from trees, sheds, verandahs, nor any covered place for men to take exercise or recreation in the day.—A sad want.
IX. Military Prisons.	1. At Waltair there is only one small guard room, which is sufficient and the air free from taint, except on one occasion about Christmas, when there was an unusual number of prisoners. The cells and guard room in the fort are too close and confined, and the arrangements for a privy and cleansing very defective.
X. Field Service.	1. There are no local regulations for field service. 2. Anything with regard to the site of the camping ground, the hours of marching, the quality of the water, &c., which the medical officer considered prejudicial, he would at once report to the commanding officer, and his suggestion would be acted on without delay. 3. The sites of camps are selected by the quartermaster, who proceeds ahead of the regiment for that purpose, subject, of course, to the approval of the commanding officer and the medical officer. The walls of the tents are slightly raised all round to admit of ventilation. If the water is thought bad, it is submitted to the surgeon, who exercises a strict scrutiny in such cases, and mostly finds his advice and opinions received with proper consideration. 4. The Indian army in the field is supplied with doolies and sick-carts, the former are expensive, but a most efficient mode of conveying the sick. The sick-cart (for less severe cases) is a heavy and most uncomfortable conveyance, being without springs; it fatigues more than it aids a sick man. An ambulance on springs in which a man could lie down is much wanted.
XI. Statistics of Sickness and Mortality.	1. No information.
XII. Hospital.	1. The hospital is a private building rented for the purpose. 2. The garrison hospital at Vizagapatam is about 400 yards from the barracks, surrounded by houses on three sides, and open to the marsh on the fourth or western side, from which at times a most unpleasant effluvium arises. The wards for men are in an upper story, and being above surrounding buildings, are open to all winds. The lower wards for women and children are in every way objectionable. The hospital of the native infantry regiment is on the parade, a low spot, nearly on a level with the swamp. The building is in other respects badly placed, and shut out from a free circulation of air, by hedges and gardens on the north and west. The hospital of the European detachment at Waltair is admirably well situated in every way, no jungle or under

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	growth of any kind, and perfectly clear, and open to every breeze from the sea. It was lately a private dwelling house, but makes a very good hospital. 3. The water supply in the garrison hospital is abundant for bathing, but all drinking water and water for culinary purposes, is brought from some distance from wells in the town. The hospital and lines of the native infantry are supplied from the same source by puckallies. The hospital at Waltair is supplied with excellent drinking water from one of the best wells in the station, which is in the hospital compound. 4. As regards hospital drainage:—In the garrison hospital at Vizagapatam there is an open stone drain which carries all refuse water into the marsh. At the native infantry hospital all refuse water sinks into the soil, and is evaporated by the sun's rays. The same at Waltair. The nuisance from this is very trifling. 5. The lower rooms of the garrison hospital are very bad, nearly on a level with the marsh, ill ventilated, low, close and dark; the upper wards good and well ventilated. The native infantry hospital has no upper story, and is on a basement raised about four feet. At Waltair the same. At the garrison hospital, roof water is carried off by an open drain to the marsh. In the native infantry hospital and the European hospital at Waltair, it sinks into the subsoil. The surface drainage and guttering round the garrison hospital are sufficient. The hospitals are all built of burnt brick and mud, as are the dwelling houses, with tiled roofs and verandahs, except on the west of the garrison hospital. The native infantry hospital has a 10 feet verandah all round, at the end fitted up as small rooms and a dispensary. At Waltair, a verandah to the east and south. In the native infantry hospital the verandahs are used for the accommodation of the sick when the hospital is full. Not so in the European hospitals. Patients have free access to them at all times for exercise. The garrison hospital has an upper story. The other two are on the basement. The following Table gives the hospital accommodation for European and native troops on the station:—

	Wards.	Beds.
Garrison hospital. Constructed prior to 1809 - -	16	92
Native infantry hospital - - - - - -	2	30
Hospital, Waltair - - - - - - -	5	35
Total -	23	157

Wards.	Regulation Number of Sick per Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
GARRISON HOSPITAL.		Feet.	Feet.	Feet.			Feet.	Feet.		Feet.	Feet.
Europeans 1 - -	8	37	16	13	7,696	962	74	2	2	5	4
1 - -	8	37	16	13	7,696	962	74	,,	None.	—	—
1 - -	4	16	15	13	3,120	780	60	,,	1	5	4
1 - -	4	16	15	13	3,120	780	60	,,	1	5	4
1 - -	4	16	15	13	3,120	780	60	,,	1	6	5
1 - -	4	16	15	13	3,120	780	60	,,	1	6	5
1 - -	6	22	16	11	3,872	645	58	,,	2	6	5
1 - -	6	22	14	11	3,388	564	57	,,	None.	—	—
1 - -	4	16	15	11	2,640	660	60	,,	1	6	5
1 - -	4	16	15	11	2,640	660	60	,,	None.	—	—
Females 1 - -	8	33	12	11	4,356	544	49	,,	6	4	3
1 - -	4	18	12	11	2,376	594	54	,,	1	4	3
1 - -	6	24	12	11	3,168	528	48	,,	4	4	3
Natives 1 - -	8	40	11	11	4,840	605	55	,,	2	4	3
1 - -	6	33	11	11	3,993	665	60	,,	2	3	3
1 - -	4	16	11	11	1,936	484	44	,,	1	5	4
NATIVE INFANTRY HOSPITAL.											
1 - -	28	94	13½	17½	22,300	796	45	,,	10	4½	3
1 - -	2	18	7½	12	1,620	810	45	,,	2	4½	3
HOSPITAL, WALTAIR.											
1 - -	8	28	19½	15½	8,463	1,057	68	,,	None.	—	—
1 - -	6	18	18	14½	4,698	783	54	,,	2	7	4½
1 - -	5	18	18	13½	4,374	874	64	,,	None.	—	—
1 - -	10	34½	18	13½	8,383	838	62	,,	None.	—	—
1 female	6	18	18	14½	4,698	783	54	,,	None.	—	—

The upper wards of the garrison hospital get all the winds going, so does the hospital at Waltair. The native infantry hospital is shut out from the sea breeze.

The windows in the garrison hospital have glass and venetians. The native infantry half glazed venetians, defective in the admission of light and air when closed.

At Waltair there are doors with Venetian blinds; glass windows are wanted.

6. All the hospitals can be perfectly ventilated at any moment by opening a sufficient number of doors and windows. No special arrangement is made for ventilation except in the native infantry hospital, where three or four portions of the roof are raised a few inches for this purpose.
7. There are no means of cooling the air admitted into the wards other than punkahs.
8. No means of warming the wards are required at the station.

The walls and ceilings are well cleansed and lime-washed on a requisition from the medical officer.

9. The privies in the European hospital are stools over tubs, carefully removed and cleansed twice a day by toties. Urinals in the same way, a plan that answers well in India, if care

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	be taken that the toties carry off the soil to a sufficient distance, and deposit it where winds cannot convey effluvium to the barracks. At the garrison hospital there is a drain from the privy, flushed with water from the well, and all carried into the marsh and removed by the tide. In the native hospital the privy is kept clean by toties. In all the hospitals bed pans and night chairs are used when necessary. 10, 11. Baths, tubs, and towels are supplied for washing and bathing in a separate room; quite sufficient. 12. Hospital linen is washed and dried by native washermen. 13. Storage is in charge of the commissariat, and generally sufficient. The department is responsible that supplies are issued in good order. 14. The cot frames are of wood laced with tape, or of iron with flat iron bars. Nothing can be better than this style of cot when the frames are of iron. It is easily kept clean and free from bugs. Flat iron instead of tape is not so comfortable as tape. The sepoys cover the iron with planks. Wooden frames are apt to be sadly infested with bugs. 15, 16. The hospital cook-room is similar to that used in all officers' quarters. A regular cook is hired, and the commissariat is responsible for the cooking. Any complaint from the medical officer is attended to. The cooking is generally good. The diets can be varied to any extent, at the will of the medical officer, all that is required being an explanatory memorandum, for the satisfaction of the superintending surgeon, who countersigns all diet rolls, and satisfies himself that the deviation from the ordinary diet is required. In native hospitals men cook their own diets, and when too ill to do so an orderly friend is detailed for the purpose. When sago, arrow-root, or barley water are necessary, they are cooked for the men, and taken as medicines, either with or without brandy and wine. Fowls are occasionally supplied where men are much emaciated and require support. 17. For nursing, a hospital serjeant or havildar is attached to each hospital, who is responsible for the order, cleanliness, &c., of the hospital. Two toties to each native hospital, or more if required, are supplied by the commissariat on indent, sanctioned by the superintending surgeon, who is the judge of the necessity. Orderlies as nurses are supplied on the requisition of the medical officer. The attendance is sufficient. 18. As regards their sanitary condition generally, the garrison hospital, and that of the native infantry, are both badly placed in every way, the garrison hospital especially, yet no epidemic disease has prevailed in either of them; neither hospital gangrene nor pycemia. 19. The garrison hospital and the barracks for the veterans should be removed to Waltair, and the native infantry lines and hospital to some open ground near Waltair. 20. Convalescents take air and exercise on the sea beach, the best possible place for them, and when too weak to walk so far, they are carried there in a dooly. 21. Wards are set apart for the treatment of sick wives and children of European soldiers, who are attended by a nurse. All cases of confinement are thus attended in hospital, or in their private quarters, at the discretion of the medical officer. The arrangements are satisfactory. 22. There are no special local hospital regulations. 23. The medical officer has the power of representing, through his commanding officer or superintending surgeon, anything he considers objectionable in a sanitary point of view, and if practicable his suggestions are generally attended to. In regard to repairs of buildings, &c., they come under the quartermaster-general's and engineer's departments, and meet with every requisite attention. In regard to change of diet, there is a varied diet table, and additions or alterations, to meet the wants of patients, are made at the suggestion of the surgeon at once, and are afterwards sanctioned by the superintending surgeon; an arrangement which allows perfect freedom to the medical officers, while abuse of the privilege is checked by the required counter-signature, which, if withheld on sufficient grounds, would throw the extra expenditure on the medical officer. The same rule is applicable to camps and to troops on march. The commissariat are generally able to meet at once all ordinary demands. 24. The European hospitals are sufficiently large to allow of convalescents being in a separate room. There is no convalescent hospital, nor is such an establishment required. Native sick convalescents do better with their families to nurse and cook for them, attending at the hospital when ordered to do so.
XIII. Burial of the Dead.	1. The Protestant burial-ground is well placed, half way between Waltair and Vizagapatam, clear of prevailing winds. The Roman Catholics bury on the edge of the swamp. Some native burial grounds have been moved out of the town by the municipal association, particularly a Mahomedan one, at the entrance of the town from Waltair, which was often very offensive. 2. The Protestant burial-ground is walled in, and about 100 square yards in area. Soil dry and sandy. It is well and cleanly kept. 3. There is sufficient space for the dead, and no crowding. The ground is nearly full, and more will be enclosed. Graves are about five feet deep, and no necessity for re-opening them. Persons dying after 9 A.M. are generally buried the next morning at sunrise. If earlier than that, the same evening in hot weather. So again, those that die after sunset are buried the following morning. Interference is not usual with native arrangements on these subjects, unless they become in any way offensive or a nuisance, when of course proper measures are taken. 4. The graveyard is not offensive. 5. The dead of the camp followers or bazaar people are disposed of according to caste. The higher orders of Hindoos burn their dead, the lower orders and Mahomedans bury. 6, 7. No injury accrues to health from the present practice, and there are no suggestions to make on the subject.

(Signatures) C. Pooley, Colonel commanding Station.
Chas. T. Smith, Garrison Surgeon.
Ed. Blagrave, Captain, Madras Engineers, Dist. Eng.

(No date.)

ARCOT.
MADRAS.

ARCOT.

Accommodation - { Queen's Troops - Infantry - 366 non-commissioned, rank and file.
Native Troops - { Cavalry - One regiment, or
Infantry - One regiment.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The surrounding country is high and barren in the immediate vicinity of three sides; low and cultivated on the south side. It is sandy and dry, and surrounded by hills. There is jungle on the southern side near the river, which is a quarter of a mile from the station. Several large tanks are in the neighbourhood. 2. The elevation of the station above the sea is 550 feet, and the adjacent country about 30 feet above water level. The nearest water is about 15 feet distant. There is higher and healthier ground within a mile, from 50 to 100 feet above the station, very open and uncultivated, but well adapted for a military camp and exercise ground. 3. The nearest table land is at Palamanair, 50 miles off, and about 1,000 feet higher than this station. 4. The Pallar river, which is distant about a quarter of a mile, is dry three parts of the year. There is no overflow of water in the vicinity. Within 400 yards of the station there is broken ground, converted into a tank in the monsoon, producing rank vegetation and fogs, indicative of malaria. 5. The station is open and exposed to winds, but not encumbered with buildings or higher ground, so as to interfere with ventilation. The temperature of it is only raised by the reflection from the sandy soil. On the land side, the station is exposed to cold and variable winds, and it is beneficially affected by the sea breeze. 6. The surrounding country beyond the immediate neighbourhood is cultivated. There are works of irrigation within a mile, but their action does not affect health. No rice or indigo is cultivated within the limits of the station, nor is the preparation of hemp or flax carried on near it. 7. The village of Ranypett is within 100 yards of the barracks, and the large town of Wallajahnugger distant two miles. 8. The district is slightly elevated above the valley of the Pallar river, surrounded by hills of granite, the surface sandy, and the subsoil chalk and clay. The ground does not appear to have been previously occupied. 9. The depth below the surface at which water is usually found is from 25 to 30 feet in both the dry and wet seasons. 10. The rain flows readily away and is soon absorbed from the surface. There is higher ground about the centre of the cantonment than the surrounding parts, immediately in the line of drainage towards the river, so that the rain never lodges in any considerable quantity at any spot. 11. The water supply is derived from wells. There is a tank within half a mile covering five or six acres. It is generally full. There is no microscope at the station, therefore the nature of the plants and animals in the water cannot be ascertained. No tank is used for drinking purposes. The wells containing drinking water are kept clean. One tank probably produces malaria, and is a nuisance; the best means of prevention would be to keep water in the tank constantly. 12. The wells are sufficient for the present water supply. The water is clear, wholesome, and without smell. Its quality is good and not injurious to health. The quantity sometimes runs short in the hot season. It is raised by leather buckets, and distributed by water carriers. There are no means of better supply. 13. It would be a great improvement if the station was on the neighbouring high ground. 14. New stations are selected by experienced officers in the service, military and medical.
II. CLIMATE.	1, 2. There are no means or instruments for registering meteorological observations. No register has consequently been hitherto kept. 3. The climate is generally a dry heat. In the monsoon and cold weather is subject to fogs on the lower ground, which extend on to the irrigated land. It is not affected by tree-planting, &c. In the hot weather occasional dust storms take place. The troops are generally healthy; no alteration in the usual diet, shelter, or clothing required. Drills, &c., in the open air should not be later than 7 a.m. or before 5½ p.m. The hot weather and the cold weather are the most healthy, immediately before and after the monsoon unhealthy. No disease has prevailed endemically or epidemically during the last 12 months. 4. There is no more healthy district nearer the station than Palamanair, 50 miles off, at a higher elevation of 1,500 feet. It is at all times considerably cooler, and has ample natural drainage. Water is procurable by wells. If thoroughly cleared of jungle, a very eligible site for a station might be obtained. 5. Have served at Secunderabad, where dysentery prevailed, Bellary, Bangalore, Arcot, Fort St. George, Burmah, Oude, Lower Bengal. Of these Bangalore was the most healthy, the remaining stations in India about equal, and Burmah unhealthy.
III. SANITARY CONDITION OF STATION.	1, 2, 3. No replies. 4. Total number of rooms or huts.—Eight. Total regulation number of non-commissioned officers and men.—360 non-commissioned rank and file (Europeans).

Barrack Rooms Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
	Each.	Ft.	Ft.	Ft.	Ft.			Ft. in.		Ft. in.	Ft. in.
6	45	100	30	15	45,000	1,000	66⅔	1 8	84	4 4	3 3
2	28	156	18	10	28,080	1,000	100⅔		44	3 9	2 4
32	1 serjeant	9½	8½	12	969	969	80¾		36	3 9	2 4
Guard Room	—	42	23	10	9,660	—	—	—	1	3 9	2 4
Prison Cells	—	20	11	10	2,200	—	—	—	—	—	—

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides of the rooms and open inwards. There are verandahs on both sides of the barracks running the length of the whole building, their width is 9 feet 6 inches. The serjeants' rooms are in the verandahs, with this exception they are open and not used as sleeping quarters. There are no jalousies or jhilmils. 6. Wooden cots, iron cots, and patent iron cots covered with canvass, and bedding, blankets, cotton quilts, carpets, and sheets are used. 7. For European soldiers double-poled tents are used in camp, made of canvass, cotton ropes, lined with blue cloth, with double roof, length 14 feet, breadth 14 feet, height 10 feet in the centre, cubic space $78\frac{2}{5}$ feet per man. Superficial area per man 7 feet $\frac{21}{25}$ths, and 25 men to each tent. 8. There are upper ventilators above the windows in the barracks. The tents have windows and doors. The guard room, one door, two windows, and upper ventilator. The ventilation is sufficient to keep the air pure by night and day. Punkahs suspended from the roof are used for cooling the air of barrack rooms. The cost is about 12 rupees each. The punkah consists generally of a long board suspended horizontally from the roof, within about 7 feet from the ground, having a fringe attached to its lower end. It is pulled by means of ropes from side to side, and so circulates the air. Also by kus-kus mats, which are placed in the doorways and windows, and kept wet, which causes the hot air to become quite cool. 9, 10, 11. The walls of the barracks are built of brick in chunam, and partly clay. Pantile roof, floor of square brick, granite stone. and chunam. The tents are made of canvass, ropes, and bamboos. The floors are not raised from the ground. The materials are good and suitable. The barracks and cantonments are kept in repair by the public works department, when called for by the commanding officer, who is responsible for the sanitary state of the cantonment. The walls and ceilings are cleansed and limewashed when deemed necessary by the commanding officer. 12. There are no baths or lavatories, but the men use tubs filled by water carriers. 13. Ordinary cooking utensils are provided by the commissariat, consisting of iron frying-pans and coppers. The washing is entirely undertaken by native washermen, who receive a shilling a month from each soldier for doing it. 14. Privies are emptied and cleaned by totties, a class of natives whose occupation is of this character. 15. These buildings are ventilated in the roof and lighted by common lamps. The barracks are lighted at night with globe lamps from the roof. 16. There are no sewers. There is a long drain the whole length of the barracks, which carries off the surface drainage below them. The drainage is sufficient for the surface water, but not for the cook-houses, &c. No part of any of the buildings is damp. The fluid refuse partly sinks into the subsoil, and partly is taken away by hand. The cesspits for privies are about 6 feet square. They are not near any tank or well, and are cleaned daily. They are distant about 50 yards from the barracks and 30 from the hospital. There are no foul ditches. 17. Convicts are constantly employed for surface cleansing, which is efficiently done. The refuse, &c., is carried away to a distance and buried. 18. The surface of the cantonment is kept free of vegetation, and nothing interferes with the ventilation of the station. 19. The drainage of the bazaar is sufficient. Ventilation, cleanliness, and crowding, much the same as in others. The water supply is good. There are no latrines. Convicts were formerly employed for cleansing the bazaar. It is now under the civil authority. The native houses are good. Dungheaps are not exposed. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Animals are slaughtered about half a mile distant from the station. There are no regulations in force regarding slaughtering places. The offal is carried away daily. No nuisance is experienced. 21. There are no bazaar horses. 22. Cavalry horses are picketed in regular lines fully half a mile from the barracks. There is no cavalry at this station at present. 23. The married people occupy a separate barrack. The rooms are divided by curtains.
Officers' Quarters.	There are no officers' quarters.
V. Health of the Troops.	1. The station, district, and native population are healthy. 2. The ordinary diseases that natives are subject to prevail here; but not to any great extent that I am aware of. Epidemic cholera sometimes breaks out, but not above the average of other districts. 3. The following are the circumstances which bear on the health of the neighbouring population :—Ranypett is situated on the north bank of the Pallar river, and surrounded on three sides by paddy fields, jungle, and low swampy ground, to which might be attributed any epidemic in an unhealthy season ; whereas Wallajahnugger, situated on the north side of the cantonment, and on considerably higher ground, is less subject to epidemic influences. 4. The troops at this station are composed of men of the three Madras European regiments, being recruits from England, time-expired men, and invalids, none of whom remain permanently. No statement of their previous state of health is forwarded from their respective regiments. Their general health is good. The barracks occupied are two separate buildings, the lower of which is considered less healthy than the upper, on account of its low situation and some defect in drainage. 5. The troops are not camped out unless cholera prevails. 6 to 13. No knowledge of hill stations, but it is my opinion that they should be selected for the location of troops. 14. Either location on the hill stations, with short periods of service on the plains, or service on the plains with short changes to the hill stations, would be preferable to the present arrangements; but the former would be more beneficial to the troops. Frequent change of station would be beneficial, especially for convalescents. 15. No experience of barrack and hospital accommodation provided at hill stations.

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	16. An elevation of between 2,000 and 3,000 feet above the level of the sea appears from experience to afford sufficient immunity from the most virulent forms of tropical fever, and other diseases incident to tropical climates. 17. A table land of some extent exists within 50 miles of this station at Palamanair, which is considered an eligible location for troops. It is easy of access by road, has an elevation of more than 1,500 feet, with a mild bracing climate agreeable to European constitution. 18. No particular class of surface or subsoil affects the health of the station, which has other objections than soil to make it unhealthy; but any subsoil, whether clay or chalk, if not sufficiently porous to allow the rains to percolate, should be considered as objectionable. 19. The best age for soldiers proceeding to India is from 18 to 20 years. They should arrive in India the month after the monsoon. On arrival from England, troops have the usual barrack accommodation, are clothed according to season, and go through the usual course of instruction drill till they proceed to join their regiments. Suitable clothing, and particularly covering for the head, which would afford protection from the sun, and restriction to quarters during the heat of the day, would preserve the health of recruits. Precaution should be taken to prevent the men from eating country fruits and vegetables in excess. 20. Troops should be sent direct to India, but to the hills immediately on landing. 21. The mode of transport for troops is by railway and bullock coaches, where roads will permit it, otherwise by marches, with tents, that are carried by the commissariat. No additional precautions for the preservation of health are required. 22. The number of years British soldiers should serve in India is ten; but if they have retained their health, there is no objection to their serving for a pension. 23. Conflicting opinions need not arise as to invaliding. 24. Invalids should leave India so as to arrive in England in spring, or early summer.
Diseases.	1. Inspections for the discovery of diseases are made weekly. 2. There has been no scorbutus among the troops. 3. The proportion of cases of hepatic disease, on the total number for the last two years, was 2·85. It generally arises as a primary disease, and more particularly in those of intemperate habits. 4. Dracunculus is almost unknown at this station, even amongst the natives. 5. The proportion of the constantly sick from venereal disease is 19 per cent. for the last two years. In all stations where Europeans are quartered, it would be advantageous to have lock hospitals, and periodical inspections of houses suspected to be brothels. 6. The following is a Table of sufferers from epidemic and endemic diseases :—

Year.	Diseases.	Per-centage of Admissions on Total Admissions.	Per-centage of Deaths on Total Deaths.	Year.	Per-centage of Admissions on Total Admissions.	Per-centage of Deaths on Total Deaths.
1857-58	Fevers	6·5	—	1858-59	11·07	—
	Dysentery	6·5	50·0		5·2	·8
	Cholera	—	—		10·2	84·0
	Small-pox	—	—		—	—
	Rheumatism	1·8	—		5·8	—

1857–58. Total admissions - 107
„ deaths - - 2
1858–59. „ admissions - 343
„ deaths - - 25
} Average strength per month for the last two years - - } 118

7. Fevers of a typhoid character have lately appeared; but not to any extent amongst the Europeans. Not a single case of dysentery has originated in the station since my arrival a year ago. Diseases are most prevalent after the rains; they are not attributable to climatic or atmospheric conditions. These remarks refer to the Europeans; no data for natives living in the town. There is nothing in the personal habits of the troops or native population predisposing to these diseases.
8. The outbreak of epidemic cholera in the beginning of last year was attributed to the drainage at the barracks being imperfect. The duties of the men are light, and do not predispose to cholera.
9. Quinine has not been tried as a prophylactic against malarial diseases.
10. The disuse of the lower barracks, or the removal of the troops to higher ground, would prevent disease.

INTEMPERANCE.

1. The soldiers are temperate, there are no confirmed drunkards.
2. The admissions into hospital from the 1st April 1859 to 4th March 1860, were 229; of these there were, delirium tremens, 2; ebrietas, 2. The remainder all marked as temperate. Drunkenness is always punished as an offence.
3. Spirits are sold at the regimental canteen under regulations. Arrack of the best quality is supplied by the commissariat. Each man is allowed two drams per diem. Spirit is not allowed as a ration under any circumstances at the station. No liquor is issued till 1 p.m. It is never given as a ration to convalescents. No other than intoxicating drinks is sold at the canteen.
4. The consumption of spirits is injurious, except when malt liquor is not procurable. It is not conducive to the efficiency or discipline of the corps, except when taken with great moderation.
5. If malt liquor could be supplied it would be beneficial to abolish spirits. Beer and porter are conducive to health, and wines in moderation are not injurious.
7. Tea and coffee are much used. Malt liquor, at proper times and in moderation, is beneficial in addition to tea and coffee.
8–10. It would be beneficial to the health of the troops to suppress the spirit ration and substitute beer, and to prohibit the sale of spirituous liquors in the canteens. Such a supply of malt liquor should be in store that the canteens could never be without it.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	11. Extract from canteen regulations :— The maximum issue to any one man in one day is as follows :— Spirits, 2 drams, but no wine or malt liquor; or Spirits, 1 dram, with 1 quart malt liquor, or two drams of wine; Wine, 4 drams, but no spirits or malt liquor. Recruits at drill are not allowed to receive daily more than 1 dram of spirits or 2 drams of wine, or 1 quart of malt liquor. Vendors of arrack in the bazaar are prohibited from selling it, or any spirits, to European soldiers. The canteen regulations are strictly enforced.
VI. Diet.	1. The rations for Queen's British troops and European troops of the Indian army are the same, and consist of, per diem per man,— 1 lb. of bread. 1 lb. of beef or mutton. $\frac{5}{7}$ oz. tea, or $1\frac{3}{7}$ oz. coffee. $2\frac{1}{2}$ oz. sugar. 4 oz. rice. 1 oz. salt. 1 lb. vegetables (when procurable); and 3 lbs. firewood. There are no periodical changes. There is a responsible inspection of the ration by the regimental orderly officer of the day and quartermaster. 2. No fruit is supplied, nor is any stoppage made. Soldiers have three meals a day, viz., breakfast, at 8 a.m., half rations; dinner, at 1 p.m., half rations; tea, at 5 p.m. The proportion of vegetables is 12 oz. potatoes and 4 oz. of onions. 3. No improvement is suggested in the ration. The rations are handed over to orderly corporals of companies, who are responsible for them. 4. The cooking apparatus consists of iron frying-pans, copper boilers with covers, containing twelve and nine gallons, supplied by the commissariat. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. The food is both boiled and roasted. The cooking is properly done, and sufficiently varied. The men have tea and coffee before a march. 5. Soldiers' gardens, for the cultivation of vegetables, could be advantageously established, if ground and seeds were provided; it would be a recreation for the men to keep up the garden.
VII. Dress, Accoutrements, and Duties.	1. The dress is as follows :— *Review Order.* Tunic and shako. Enfield rifle and bayonet. 1 cross-belt and pouch (40 rounds). 1 waist-belt and pouch (20 rounds). 1 cap-pouch in tunic (70 caps). *Undress.* Shell jacket, or Khakee tunic. Woollen or khakee trousers, according to season. A sun-proof helmet in hot weather, with khakee clothing. Forage cap, when cloth jacket is used. The present dress is suitable. The boots should be always of English manufacture. The guard dress is either khakee or cloth, according to season. The European sentries are never exposed to the sun. Night sentries have sentry-boxes to stand in when it rains.
Duties.	1. It would be advisable that the men be thoroughly drilled at home. 2. The routine of soldiers' duties is,—parade in the morning after sunrise, answering roll-calls, or guard duty. Recruits have drill for an hour after sunrise, one hour before sunset, and an hour in the forenoon, inside the barracks, under cover. The health of the men does not appear to suffer from drill. The best hours for drill are at sunrise or early dawn, and an hour before sunset. The average number of nights men have in bed is four during the week. 3. Guards are mounted at the gates of the barracks. The men are on duty 24 hours. There are roll-calls by day at réveille, when there is no parade; at breakfast, dinner, 4 p.m., retreat, and tattoo. Well-behaved men excused roll-calls at retreat; check roll-calls by day and night when necessary. If the men have a proper proportion of nights in, guard duty does them no harm.
VIII. Instruction and Recreation.	1. The following are the means of recreation :—There is no ball court, but there is a skittle-ground. There is a school with one master. There is no separate library, but plenty of books, which can be read till 8 p.m., when all lights are put out. There are day rooms. There are no soldiers' gardens, workshops, theatre, or gymnasia. The men are sufficiently occupied during the wet season and the heat of the day. The men are restricted to barracks from 9 a.m. to 5 p.m., and the result is beneficial to their health. 2. A fives court and garden would be a great addition to their recreation. 3. A savings' bank is established with very great advantage. 4. There is not sufficient shade in the regular barracks at this station, but there is in the barrack occupied by the European infantry depôt, which is the hospital of the European corps when quartered in the barracks.
IX. Military Prisons.	1. There are no military prisons at this station.
X. Field Service.	1. There are no local regulations for field medical service. 2. Should the camp be proposed to be pitched on ground that the surgeon considers unhealthy it is shifted to other ground. 3. The surgeon should be consulted as to the locality of camping ground before it is fixed on, and unless any military reason should exist to the contrary, his opinion should be acted on. 4. Doolies and sick carts are used for the transport of sick.
XI. Statistics of Sickness and Mortality.	1. No replies.
XII. Hospitals.	1. No sketch. 2. The hospital is 100 yards from the nearest building and half a mile from the horse lines. It is a quarter of a mile from the bazaar, and not crowded by houses. The site is open, freely ventilated, and healthy as to elevation, drainage, absence from malaria, &c. 3. The water supply is abundant and wholesome. 4. The means of removing refuse water and impurities is by hand carriage to a distance of 30 yards from the hospital. 5. There is no perflation of air underneath the wards of the hospital. The roof water is carried away by ordinary channels. Drains are cut in all directions to carry off rain, which answer the purpose. The hospital is built of brick and chunam, with tiled roof, not double.

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*con.*	The hospital is cool. It is supplied with verandahs 9 feet 6 inches broad, and they afford sufficient shelter from the sun's rays. The verandahs are never used for the accommodation of the sick or convalescent. The building consists of one flat. The following table gives the accommodation :— Total number of wards.—Two in European hospital, and two in native hospital. Total regulation number of beds.—According to the number of patients.

Wards or Hospital Huts, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
								Ft. in.			
European Hospital, but at present used as a barrack for the European Infantry Depôt, 6 rooms.	In two wards each 34.	Of two wards each 49½ ft.	Of two wards each 40 ft.	Of two wards each 17 ft.	Of two wards each 67,320.	1,000	Of two wards each 35 5/17 ft.	1 8	Of two wards each 14.	Of 2 wards each 6ft. 4in.	Of two wards each 4ft. 6 in.
	In 4 wards 5 each.	Of 4 wards each 35 ft.	Of 4 wards each 14½ ft.	Of 4 wards each 10 ft.	Of 4 wards each 2,300.	1,000	Of 4 wards each 105¾ ft.	1 8	Of 4 wards 13 windows.	Of 4 wards 6ft. 4in.	Of 4 wards 4ft. 6in.
Arcot Hospital, now used for Europeans and natives, formerly the Native Hospital, 2 rooms.	25 Europeans or 30 natives.	Each 44 ft.	Each 39 ft.	Each 14½ ft.	24,882	1,000 for Europeans.	64 8/25 ft.	1 8	20	4f . 4in.	3ft. 9in.

The hospital is so placed as to receive the full benefit of the prevailing winds. The windows open inside, and are well adapted for ventilation and coolness.

6. The wards are perfectly ventilated by windows and ventilators in the upper part of the wall. There are no jalousies or jhilmils.
7. Punkahs and kus-kus mats, which are watered during the hot winds, keep the air admitted to the wards perfectly cool.
8. Means of warming are not required. The ceilings and walls are cleansed and limewashed when considered necessary.
9. The privies are 30 yards distant, but connected by a covered passage. They are built of brick and chunam, and the roofs tiled. They are cleaned by hand, and are not offensive.
10, 11. Earthen bowls are provided for the sick to wash in, &c. The means of bathing for the sick are not sufficient.
12. Native washermen undertake the whole of the washing and drying of the hospital linen.
13. The storage is sufficient and dry.
14. Bedding is supplied by the commissariat, and consists of painted iron or wooden cot, with tape, a palliasse when marching in the field, two quilts of gingham, both lined and one quilted with cotton, one blanket, and two pillows.
15. The kitchen is sufficient for all practical purposes, and the cooking is properly performed.
16. Copies of diet table, diet rolls, &c. will be provided by the head of the medical department.
17. With reference to attendance on the sick, any patient can have a separate orderly on the requisition of the surgeon.
18, 19. The sanitary condition of the hospital is good; hospital gangrene or pyæmia have not appeared.
20. Sick carts provided by the commissariat, in which convalescents take the air morning and evening, is the only provision for their exercise.
21. Soldiers' wives are treated at their own quarters, there being no accommodation in the hospitals. The present arrangements are satisfactory, the families being so limited in number.
22. There are no special hospital regulations enforced at the station.
23. The medical officer has full powers in matters appertaining to the sanitary state of the hospital, &c., and recommends any alteration that he considers necessary.
24. There are no convalescent wards, nor would such accommodation be of advantage.

XIII. BURIAL OF THE DEAD.

1. The burial-ground is about 600 yards off from the station. It is not to windward.
2. Its length is 144 yards, breadth 98 yards; the height of the walls is 7 feet. The subsoil is clay, well drained; decomposition takes place readily, and the ground is carefully kept.
3. The regulations as to burial are :—Three feet interval, and the grave space 7 feet by 3, the depth is 6 feet. Graves are never re-opened. Interment is compulsory at ordinary times 12 hours after death, and during epidemics immediately after. There is no burial-ground for native troops at this station.
4. The grave-yard is never offensive. British troops are buried according to regulation.
5. The dead of camp followers and bazzar people are removed by men of their own caste.
6, 7. No injury to public health accrues from the present practice, and no improvement in the way of regulation or otherwise can be suggested.

(Signed) THOMAS RAIKES, Major,
Commanding Arcot.
H. L. PRENDERGAST, Captain Engineers.
RICHARD ARNOLD, Assistant Surgeon,
In Medical charge, Arcot.

(No date).

MASULIPATAM.

Accommodation — Queen's Troops Infantry: 28 convalescent rank and file of Her Majesty's 1st Royals and 18th Royal Irish. There is accommodation for 220.
Native Troops Infantry. 800 rank and file of the 12th Regiment Madras Native Infantry.

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is flat, sandy, and unpicturesque. To the south-east of the station lies a large tract of land, which was formerly covered by the tide at high-water, but has been reclaimed within the last 20 years by means of dykes, and is now nearly dry during the whole year. To the west lies the Sultanagram swamp, from 500 to 1,000 yards in width, full of fresh water (the drainage of the surrounding land) to a depth of from 2 to 3 feet during the monsoon season, and dry in the hot months. There is a good deal of wood, principally palmyra and date palm, but no jungle in the vicinity. Good drinking water is only to be had at particular wells, but brackish water is generally abundant. 2. The station is from 4½ to 8 feet above ordinary high-water; some parts of the station being higher than others. It is on the same level as the country to the north and south, and below all the land to the west; its elevation above the nearest water is 4½ feet. There is no higher or healthier ground adjoining the station. 3. The nearest high land is the Condapillay hills, about 55 miles off at an elevation of about 900 to 1,000 feet about the level of the station. 4. The navigable and irrigable canal between Masulipatam and Bezoarah will pass within three miles of the cantonment. The sea is about four miles distant. During the monsoon the station is closely surrounded by marshes, which speedily evaporate in the hot weather. The vicinity is liable to overflow from the river Kistnah at the time of extraordinary freshes, as in August 1853, but the overflow lasts only a few days. At the time of great hurricanes at sea the tide has been known to come up as far as the station. There are several small water pits, at a low level, about the station; they are not considered to produce any injurious effect. 5. The station is open and freely exposed to winds; it is surrounded by hedges and gardens, but by no higher ground. There is no reflected sun heat from buildings, but in the hot weather there is a great deal from the sandy soil. The station is exposed to the influence of hot land winds, which, beyond a debilitating influence on the system, exert no other injurious effect; the sea breeze, on the contrary, is very refreshing and invigorating. 6. The neighbourhood of the station is only cultivated now in small patches, but all the land will be brought under cultivation as the Kistnah anicut channels reach it. The irrigating channels from the Kistnah anicut will pass close to the station. Artificial irrigation has not yet been brought near here, but experience tends to show that it does not, as a general rule, act injuriously upon health. The cultivation of rice is not prohibited, there are small patches of it grown near the station. Indigo is not cultivated, nor is the preparation of hemp or flax carried on near it. 7. The adjacent native town of Masulipatam probably contains between 50,000 and 60,000 inhabitants. 8. The district consists principally of the delta which has been formed by the river Kistnah, the surface and subsoil in the greater part of it are of black cotton soil. Sand is occasionally found at depths varying from a few feet to several yards. The cantonment and native infantry lines occupy new ground at some distance from the old native town. There are no mineral productions in the district. The following is a short account of the past and present history of the station of Masulipatam; for, as most of the questions refer exclusively to European troops, without it the replies to many of them will not appear explicit. When Masulipatam was first occupied by the British, both the European and native troops were located in the fort. In progress of time the civil servants and staff officers of the garrison built houses in an open sandy plain on the north-east side of the Pettah, or native town; after a season or two, a regiment of native infantry was cantoned in prolongation of these houses; and the usual place of arms, hospital and hutting lines, erected for them. These buildings now form the present station of Masulipatam. The houses alluded to are occupied indiscriminately by civil servants, missionaries, and European officers of the native regiment. No portion of the ground was ever defined as a military station, nor is any portion under military control, save the place of arms and sepoy hutting lines. The fort was exclusively under military control; it was garrisoned by a regiment of Europeans, and one of native infantry, but both were withdrawn years ago, leaving, as before stated, one regiment of native infantry only in the lines on the east side of the native town, and at 3½ miles from the fort. Since the withdrawal of the European regiment, the European barracks and hospital in the fort have been simply kept in repair, and have been occupied for short spaces of time by parties of European soldiers, embarking and disembarking at this place on their way to and from the large cantonment of Secunderabad, and other stations in the Dekkan. Convalescent men are also sent here from those stations for change of air, and occupy the fort barracks and hospital. But by late orders of the Madras Government, Coconadah, a place 115 miles north of Masulipatam, is being made a port of embarkation and disembarkation; the whole of the stores are to be returned, and all public buildings in the fort, including barrack and hospital made over for civil purposes. There is now only in the fort a party of 28 convalescent soldiers, and at the station the 12th Madras Native Infantry, 800 strong. When the above arrangement is completed, convalescents will no longer be sent here; the Native Infantry regiment, it is thought, will remain. 9. Water is found during the dry season from one to three yards below the surface, and from 1 to 2 feet during the rainy season. 10. The rain fall and surface water does not flow readily away for want of proper drainage channels into the natural outlets for it, which are the swamps to the north-west and south-east of the station. A small per-centage is drained off by two little channels, and a good deal sinks into the soil, but the rest lies on the surface in large shallow pools until evaporated.

MASULIPATAM. MADRAS.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	It is principally by the latter means that the rain water is disposed of. There is no drainage from higher ground passing into the sub-soil of the station, it being separated from it by swamps. 11. The water supply is derived at present from wells, but it is proposed to bring the annicut water into the station by channels or pipes, when the canal reaches this place. The water is not stored in open tanks. There are a number of pits about the station, principally made use of by washermen, in which the rain-water lies until evaporated. Four or five of these when full are made use of both for drinking and washing purposes. These remarks do not apply to sepoys, who procure their water from wells in the immediate neighbourhood of the lines; the water is of good quality. The tanks contain neither plants nor animals. When the tanks are full they are used by the natives both for drinking and bathing purposes; drinking water for the Europeans and sepoys is drawn from wells. No care is taken with the water pits or tanks, and they, probably, receive a great deal of foul matter; the wells are not, however, liable to pollution. No nuisance or malaria proceeds from any tanks within or without the station. 12. There is frequently a scarcity of good drinking water in the hot weather, owing to the wells drying up. In general it is clear. Some wells are brackish, but the others have a good taste and smell. In consequence of the want of scientific instruments, its microscopic character and chemical composition cannot be ascertained, but the water in the drinking wells is of very good quality and soft, and not in any way injurious to health. It is raised by buckets and rope, and distributed to the troops by the established water carriers. A very much better supply may easily be provided by pipes, or channels, as soon as the canal now in course of construction reaches the station. 13. With regard to any other topographical points bearing on the health of the troops not included in the above, the short period that has elapsed since the arrival of the regiment at this station, and our consequent imperfect knowledge of it precludes the answering of this query. 14. New stations are selected by the quartermaster general's department, assisted by the medical staff. The only suggestion to offer would be that some deference be always shown to the opinion of those who have been long resident in the locality where it is proposed to form the new station.
II. CLIMATE.	1, 2. There are no means for conducting and registering meteorological observations. The 12th Regiment Native Infantry have been here only three months, and native regiments are never supplied with scientific instruments for those purposes. We are consequently unable to prepare the meteorological table required. 3. The climate has the character of being salubrious. It is dry during the hot season, and the damp, during the monsoon, is not of a penetrating character. The heat is great at times during the hot land winds in April, May, and the early part of June. It is not subject to any great variation of temperature, but the early mornings in the month of February are distinguished by dense fogs, which are dispersed by the sun at about 8 o'clock. There is no tree planting or irrigation in the immediate neighbourhood. During the dry weather the station is subject to severe dust storms, which sweep across the swamp in heavy clouds, so as at times to obscure the atmosphere. The dust consists of impalpable powder, but is not injurious to health. The climate is healthy, and the troops enjoy an immunity from disease particularly of the epidemic class; in fact, its character stands so high that convalescents are sent here for the recovery of their health from the European regiments in the Dekkan. Drill ceases during the hot months. No precautions are required during the cold season. The most unhealthy months of the year are those during the change of the seasons, when ephemeral and slight intermittent fevers prevail. The station, like all others in India, is subject to periodical visitations of cholera and small-pox, but the particular season of their appearance is quite uncertain. 4. The station of Masulipatam is particularly healthy. Lieutenant Beatty, of the Engineers, after an experience of it for nearly five years, states, in a communication, "I do not think that a more healthy place could be found within a very considerable distance." 5. The medical officer (Surgeon Horak, M.D.) has served at the following stations:— 1. Neilgherry Hills, Ootacamund, Kotagherry, and Coonoor; 2. Bangalore; 3. Madras; 4. St. Thomas' Mount; 5. Palaveram; 6. Masulipatam; 7. Quilon; 8. Mangalore; 9. Burmah and China. The stations are classified according to the degrees of salubrity assigned to them by experience. The three stations on the Neilgherries possess a very fine healthy climate, and are used as sanitaria. Bangalore also enjoys the reputation of having a very healthy and comparatively bracing climate, and certainly ranks next to the hills in point of salubrity. The next four stations on the eastern or Coromandel coast are what is termed dry climates, in contradistinction to the moist damp climates of the western coast, to which category Quilon, Mangalore, and Burmah belong. About treble the quantity of rain falls on the western compared to the eastern coast. During the monsoon the rain pours down heavily, and almost incessantly, until the atmosphere becomes so thoroughly charged with moisture that it penetrates and pervades everything, and a sensation akin to a vapour bath is experienced, which exerts a very enervating and exhausting influence on the system. During the cool season the cold is not sufficiently great to produce any bracing or renovating effects, or in any way to repair the exhaustion and debility previously induced by the monsoon, hence after a longer or shorter period of residence, three years being about the average in this description of climate, great prostration of strength and lassitude supervenes, rendering change of climate necessary for their removal. Owing to the dry climate of the eastern coast, on the other hand, the process of exhaustion and prostration of the system proceeds at slower and more tardy pace, and by the adoption of proper prophylactic measures may not be experienced for 10 or 15 years. With the exception of this difference in the character and influence of the two climates on the constitution, I believe them both to be conducive to health. The only climate I have found positively injurious to health has been China, the troops there suffered from the following diseases:—Cholera, yellow, remittent, and intermittent fevers, liver and bowel complaints. On the conclusion of the peace of Nankin the left wing of my regiment, the 41st Madras Native Infantry, was stationed with the headquarters of the 18th Royal Irish, in the island of Koulangsoo, opposite Amoy. The island is about six miles in circumference, composed principally of large blocks of granite, and paddy fields in the declivities, and is divided into two almost equal parts by a range of

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	lofty hills, which traverse its centre. One side, where the ground was high and dry, almost free from artificial irrigation and freely exposed to the influence of the sea breeze, was occupied by the head-quarters 18th Royal Irish, on the other side surrounded by rice fields occupying low ground, and entirely shut out from the sea breeze the left wing 41st Regiment were stationed. The Royal Irish lost a very large number, both of officers and men, from cholera and yellow fever, while not a single case occurred on the 41st side of the island. The poison was generated on the island of Amoy, and wafted across to Koulangsoo, sweeping freely over that part occupied by the 18th. Our immunity from both diseases evidently arose from the intervening range of hills which protected us from malarious influences. Major Allan has served at the following stations:—1. Bangalore; 2. Thyet Myo; 3. Secunderabad; 4. Rangoon; 5. Coimbatore; 6. Vizianagram; 7. Bellary; 8. Masulipatam; 9. Trichinopoly; 10. Ellore; 11. Sawunt Warree; 12. Prome; 13. Goomsoor. The stations are placed in the order in which they are supposed to be relatively healthy, but it is thought that the only sure guide to test the comparative salubrity of cantonments would be medical returns, through a long number of years, showing not only deaths but invalidings also. Perceptions are often deceptive, thus Secunderabad, a temperate climate when compared with Trichinopoly, used not to be a healthier station for the European soldier than the latter, though the heat at Trichinopoly is continuous. On the other hand, it has to be ascertained whether a regiment which loses more men from acute disease in a cooler climate is not often more efficient than one in a hotter place where the deaths are fewer, but where the men are debilitated from constant heat. It cannot be asserted that any one of the stations above recorded is conducive to health, but it can be affirmed that Goomsoor and Prome were positively injurious. They are not now stations.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station, district, and barracks are transmitted. 4. Table of barrack accommodation. Total number of rooms, 20. Total regulation number of commissioned officers and men, 220.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man in Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
European Barracks.		Ft. in.	Ft. in.	Ft. in.	Ft.			Ft.		Ft. in.	Ft. in.
Total number of rooms 20 -	10	43 0 each room.	20 0	13 8	11,712	1,171	86 6	2	26 in whole barracks.	6 9	4 6
Cook rooms, 2 - -	- -	60 0 each.	10 0	9 0	—	—	—	—	—	—	—
Necessaries, 2 - -	- -	30 0 each.	10 0	9 0	—	—	—	—	—	—	—
Native Infantry Barracks or Places of Arms.	For 800 stand of arms and two guard rooms.	66 0	38 0	12 0	—	—	—	—	—	—	—
Guard Rooms.											
European Barracks (none).											
Native Infantry, 2 -	No Regulation Number; seldom more than 2 men confined at one time.	12 0	16 0	12 0	2,304	—	—	—	—	—	—
Prison Cells.											
For Europeans, 10 - -	1	8 0	8 0	12 6	800	800	64 0	These cells have been condemned and are not now used.			
For Natives, 2 - -	1	8 3	7 6	15 0	928·1	928·1	61 10	In use with the Native Regiment.			

5. The windows of the barracks are on opposite sides, and open inwards. There is an open terrace verandah on one side to the west, the whole length of each range 13 feet 8 inches in breadth, but it is not occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils.

6. The old bedsteads consist of two tressels with three planks. A light description of iron cot is also used in the barracks, &c. The latter is the best as it does not harbour vermin. The European soldier has one blanket, one quilt, two sheets, one cotton carpet, and two pillows. The sepoy has a cot provided him when in hospital but no bed clothes.

7. There are two descriptions of tents in common use in the Madras army; the European tent and the native tent. The European tent is a rectangular parallelogram on two poles, having doors opposite, and provided with shell and fly. The walls, stiffened by poles inserted at intervals in the cloth, are fastened by cord loops to the shell. Cubic space per man 3,800 feet, and superficial area per man 12·6 feet. The number of men in each tent is 25. The native tent is an oblong pent in one entire piece on two poles, with one doorway in front. Cubic space 879·29 feet. Superficial area per man 15·54 feet. The tents contain 15 men each.

8. No means exist of ventilating the barracks or guard rooms except by means of the doors and windows. The only mode of ventilating the tents is by the doors, unless the bottom of

Masulipatam. Madras.	References to Subjects and Queries.	Replies.
	III. Sanitary Condition of Station—*cont.*	the walls is raised, which is often done in camp. The ventilation is sufficient to keep the air pure night and day. No means exist for cooling the air in the barracks at this place. Punkahs are used at most stations for European troops. 9. The barracks are constructed of brick in Chunam. The barracks of European convalescents are terraced, paved with foot square sandstones. The sepoy place of arms is tiled and paved with brick. The sepoy huts are constructed of mud, thatched with palmyra leaf. The tents, both for Europeans and natives, are made of blue and white Vizagapatam cloth (a sort of coarse calico). There are two folds of white and one of blue used, but lately some tents made at this place had four folds, because the cloth was inferior. 10. The floors of the European barracks are constructed of foot square sandstones in lime, raised 1 foot 6 inches above the level of the ground. There is no passage of air beneath. The floors of the sepoy place of arms are paved with brick, and the floors of the huts are of mud. 11. The materials of the barracks are suitable to the climate, but their construction is faulty; yet, as the station has been long discontinued for a regiment of Europeans, this is a matter of no consequence. The huts occupied by the sepoys are very indifferent, but not injurious to health as the men are healthy. It would be a vast improvement if ranges of tiled or terraced huts were built for the sepoys by Government; but this is a question of finance. The material of which tents are made is suitable, but it is a question whether the tents for the European soldiers would not be better if they were made to hold only from 8 to 10 men each, and carryable on a bullock, which the present regulation tent is not. The native tent is very hot. Four plies of cloth instead of three, as at present, would be an improvement. The tents, as a general rule, are too crowded. Repairs to barracks are made by the district engineer, and are quickly executed. This is not a defined military cantonment; the police and sanitary precautions are under the magistrate and collector. The officer commanding the native regiment is, of course, responsible for these points within the limits of the sepoys' huts. The walls and ceilings of the European barracks are cleansed and lime-washed once in two years; those of the native infantry place of arms once in three years. 12. No baths are attached to the barracks. The convalescents at Masulipatam wash in large-sized tubs; they are supplied with water from adjacent wells. The waste water is thrown out in the open and absorbed in the sandy soil of the place. 13. The means of cooking provided in the barrack cook-houses are, copper boilers, frying pans, and a proportion of earthenware dishes. Water is supplied by water-carriers furnished by Government. There is no drainage. The refuse water is thrown out and quickly absorbed by the soil. The cook-room referred to here is for the use of European convalescents, and attached to the barracks in the fort. The linen is carried away by the native washermen to their washing and drying grounds; the conveniences for this purpose are considerable. 14. The privies are attached to the European barracks in the fort; the urinals are large tubs, their contents are carried away by natives hired by the commissariat for that purpose. There are no privies to the native barracks or places of arms. 15. These buildings are ventilated and lighted by means of the doors and windows. The barracks are lighted at night by lamps. 16. There are no drains or sewers attached to the barracks. The rain water disappears quickly by absorption in the sandy soil and by evaporation. The drainage is sufficient from the sandy nature of the soil, for conveying away the surface water. The contents of privies and urinals are carried away. No part of any building used as a barrack or hospital is damp. The drainage of the barracks is partly absorbed and partly evaporated. There are no cess-pools of any description in or about the station. There are no foul ditches within the station. The ditch round the fort, which is fed by the tide, is, at low water, offensive; but it does not seem to affect the health of the residents in the fort. 17. There is no surface cleansing going on. The occupiers of the houses in the station make their own arrangements for the removal of the offal in their own bounds; in the fort there are scavenger's carts which remove the refuse daily. 18. There is little surface vegetation in or about the station. There are no old walls; the hedges, when allowed to grow high, do interfere with the ventilation of the station, but the proprietors and occupants of houses generally keep them low; the trees which attain to a very large size are too numerous, and, to a certain extent, interfere with the free circulation of air; on the other hand, a shade during the hot season is refreshing. 19. The military authorities have no control over the bazaars, but they appear to be kept clean; they are entirely under civil control. With regard to the condition of the native houses near the station, it is the characteristic of all native houses to be dirty, and, if allowed, the inhabitants permit offal to accumulate in the vicinity of them, and thus engender disease; but it is understood the evil is checked as much as possible by the civil authorities. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. No European regiments being here there are no slaughtering places set apart for the soldiers; the meat is supplied for the convalescents by contract, it is killed in the native town at a distance from the station. No nuisance is experienced from the slaughtering places. Sanitive rules in the native town are under the civil authorities. 21. This being a purely civil station, but at which a regiment of native infantry is quartered, the military authorities have no jurisdiction in the bazaar. The inhabitants have few or no horses, and, except the officers' servants, there are no camp followers. 22. There are no cavalry or artillery stables or picketing grounds, none being quartered here. 23. There are only two married non-commissioned officers who are entitled to quarters; the serjeant-major and quartermaster-serjeant of the native regiment; their quarters are sufficient and good.
	Officers' Quarters.	1. The officers' quarters in the fort have not been used for years, and they will never again be occupied. The officers of the native regiments reside in detached houses in the station, they are generally commodious, and situated in large compounds; the ventilation is good, but there is no drainage except by absorption and evaporation. The water which accumulates in the officers' compound during the monsoon, and continues to lodge there in a stagnant state for about two months, should be drained off into the swamp.

References to Subjects and Queries.	Replies.
IV. Health of the Troops.	1. The station district and adjoining native population are generally healthy. 2. Intermittent fevers are prevalent at times among the native population, but they are seldom of sufficient severity to produce organic disease of the spleen. A disease common from the Kistnah river, as far north as Garrighu, is found to exist here, it is called berri-berri, its distinguishing features are numbness and a burning sensation of the body, œdema, great difficulty of breathing, with a peculiar tottering gait, and an invariable quick and weak pulse. The disease is confined to natives, and often runs a rapid and fatal course; the patient generally dies from effusion on the brain or disease of the heart, which often becomes implicated during the course of the disease. 3. The healthiness of the native population depends in a great measure upon the dryness of the climate, and the absence of all malarious influences. Natives of India do not bear wet well. Poverty of diet is often the cause of unhealthiness, but the people in this district seem well off. 4. Six companies of the 12th regiment were stationed at Rangoon from the 10th April 1857 to the 1st October 1859, previous to coming to this station. Four companies were stationed at Hong Kong from the 24th of March 1857 to the 27th December 1859. The former arrived at Masulipatam on the 10th October 1859, and the latter on the 12th January 1860. The health of the men, both at Rangoon and Hong Kong, was bad, they suffered principally from berri berri, fever, and bowel complaints. I attribute their unsatisfactory sanitary condition to the want of proper and adequate nourishing diet; all their pay was remitted to their families, and they lived almost exclusively upon the Government rations, a portion of which they even sold. During the three years the regiment was at Rangoon, the men, who in India from their infancy upwards, had been accustomed to eat meat, suddenly changed their mode of living, and adopted a strictly farinaceous diet, their constitutions became consequently weakened, and they were unable to bear up against the great and sudden vicissitudes of temperature to which these climates are liable. Since their arrival at Masulipatam their health has much improved, and a very small amount of sickness prevails in the regiment. The men's accommodation (lines) at this station is all equally healthy. 5. The troops at this station are not camped out during any portion of the year. 6. I have never been in charge of troops at hill stations. Surgeon Horak was in medical charge of the Neilgherry hills, a sanitarium for officers and their families; he found that the climate, in all cases of debility, whether induced by a prolonged residence in the plains or the result of previous illness, was most beneficial; but where organic disease had once established itself the hills acted most injuriously. The utility of hill stations is, therefore, in his opinion, considerably restricted. 7. No experience with troops at hill stations. 8. I approve of hill stations for troops, provided regiments are sent there soon after their arrival in India, and before they have contracted any latent organic disease by a protracted residence in the plains, which the searching climate of the hills is certain to actively develope, and without an immediate change would cause to end fatally. 9. Diseases are not initiated among troops on the hills, they are developed. 10. The climate of the hills, from the diminished pressure of the atmosphere is very deceptive to the feelings. The sun's rays are as powerful as on the plains, but on account of the modifying circumstances in operation, this is apt to be overlooked. Soldiers should not be allowed to expose themselves to the sun during the two hottest hours of the day; and owing to the sudden variation of temperature they should always be warmly but lightly clad—flannels and light woollens are the best adapted as articles of dress. 11. On the Neilgherry hills the season best adapted for residence is from November to the end of May. The shortest period of residence to obtain the full benefit of such residence is, —for men suffering from debility, and free from organic complications,—not less than two years; three years would be preferable. 12. The longer the period of residence on the hills the better qualified would the troops be for encountering the climate of the plains. 13. The principal precaution necessary on leaving hill stations for service on the plains is to avoid undue exposure to the sun. 14. If European troops could be permanently stationed on the hills it would not only conduce to their efficiency, but considerably diminish the rate of mortality. Short changes to hill stations from the low country, for regiments, I consider injurious for the reasons already given. Frequent change of station in the plains is decidedly beneficial, love of change is inherent in a soldier. 15. No reply to this query. 16. With regard to the elevation most suitable for sites for hill stations. In the latitude of the Neilgherry hills (about 11° N.) at a place called Kulpatty, at an altitude of 5,538 feet above the sea, jungle fever occasionally prevails; and at a place called Billicul, at a similar elevation, where an officer and his family resided, they were all seized with jungle fever and were dangerously ill. I have never known malaria to reach an altitude of 6,000 feet; which is perhaps the lowest safe range in the above latitude. 17. There is no higher ground near the present station which could be advantageously occupied as a hill station. 18. In reference to the best class of surface and subsoil for stations, dry and sandy soils in India have been more free from diseases than any other. 19. No European soldier should be sent to India till his physical powers are fully developed. He should land there in the month of November, which allows time to the men to join the regiments, if up country, during the cool season of the year. Cannot say how troops are disposed of on first landing. The precautions necessary for preserving the health of recruits on their arrival in India, is protection from the sun, and from the deleterious spirits sold in the bazaars. 20. Troops should be sent direct to hill stations on landing; and if possible kept there till required for service on the plains. 21. Troops from this station, if Europeans, proceed by bullock carts to the interior; if natives, they march at about the rate of 10 miles a day, with a halt twice a week. The health of the troops would be increased by carrying out what has already been partially tried, viz.:—having along all the principal military routes, large sheds at each halting place, with floors of planks, or bamboo, raised from the ground; and on occasions of reliefs, marching

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	men in small bodies, never in larger parties than 200,—wear and tear of tents would be thus saved, and risk of cholera diminished. 22. A British soldier should not serve more than 10 years in India. 23. No suggestions to make as to the mode of conducting the business of medical boards as regards invaliding. 24. Invalids departing for home by the Cape of Good Hope route should leave India in January; and in March by the Overland route.
Diseases.	1. Inspection parades are occasionally ordered when cutaneous disease is prevalent; which is common to the sepoy on foreign service, and is caused by low diet and the consequent impoverished condition of the blood. 2. There has been no scorbutus among the troops at this station. 3. Hepatic disease is of rare occurrence among sepoys, when it does occur it is of an idiopathic character and readily yields to treatment. With the European soldier, it is almost invariably the result of alcohol and exposure to the sun. 4. Few cases of dracunculus have occurred in the different native corps with which I have been connected. The disease is generally supposed to arise from bad water. 5. In native regiments venereal diseases are seldom met with; in European corps, however, they are of frequent occurrence, and occasionally assume a malignant type. The only means of diminishing the liability of the soldier to it would be the establishment of lock hospitals. 6. At this station the troops are epidemically affected with intermittent fever of a mild type. No diseases of an endemic character prevail; occasionally the station is visited, like most places in India, with cholera and small-pox. Sporadic cases of dysentery and rheumatism occasionally shew themselves. The 12th Regiment have only been three months at this station, and have lost none by the above diseases. 7, 8. The more frequent zymotic diseases are variola, rubeola, and scarlatina; skin diseases; diseases of the digestive organs, &c., cholera, dysentery, and diarrhœa. They are most prevalent at the changes from wet to dry and from dry to wet weather. No experience of the sanitary condition of the bazaar and native dwellings at the station. As a general rule, the abuse of opium, which is too common, is a great predisposing cause, not only of premature decay of the vital powers, but of the development of disease among the natives. None of the soldier's duties are operative in promoting the prevalence of epidemic disease among sepoys. It generally arises from causes over which the European officer has no control. 9, 10. Small doses of quinine have not been tried at this station in consequence of the absence of malarial disease, but have been employed with marked success as a prophylactic agent during different periods of my service in India. No recommendations to suggest on any of the preceding points.
V. INTEMPERANCE.	1. The station is occupied by the 12th Madras Native Infantry, the soldiers of which are most temperate. There are no confirmed drunkards. 2. There have been no admissions into hospital directly or indirectly caused by intemperance; but sometimes sepoys are admitted into hospital suffering from a powerful stimulant and narcotic poison called bhang. The sepoys seldom or ever indulge in spirituous liquors, and no table can, therefore, be constructed showing the effect of total abstinence, temperance, and drunkenness, on the amount of sickness, mortality, and crime at the station. Drunkenness is always punished as an offence. 3. At this station there is only a detachment of European convalescents sent from Secunderabad for the benefit of their health, there is therefore no canteen. Spirits are sold in the bazaars which are of a most deleterious description, but as this is not a permanent station for Europeans the amount consumed cannot be stated. The spirit is adulterated with the *datura stramonium* and other noxious ingredients, which have a tendency to injure the constitution permanently. Spirits are not part of the soldier's ration, but an addition thereto, which he may take or decline; if taken, two drams a day is the allowance permitted at the station on the march or in the field. The convalescent soldiers at this station are not allowed a dram before parade. Sepoys are of course not allowed spirits. The spirit is the best Colombo arrack. Convalescents not in hospital, and therefore, drawing the regular ration, may take the two drams of spirits a day, or they may have malt liquor if they prefer it. Spirits are only given to convalescents at the recommendation of the medical officer. No drinks, other than intoxicating drinks, are sold in the bazaar which are injurious to health. 4. If the British soldier could be restricted to the regulated allowance of two drams a day spirits would doubtless be beneficial to his health; but in consequence of the facility of procuring intoxicating liquor in this country, to which the allowance operates as an incentive, it is questionable whether its entire suppression would not be the best policy, substituting malt liquor instead. Spirits are not conducive to efficiency or internal discipline. 5. As a general rule, and for the reasons stated, it would be beneficial to abolish the use of spirituous liquors. 6. Beer has a very strengthening and refreshing effect in this country, and nourishes without unduly exciting the system. Wine also in moderation is also an agreeable stimulant, but not so well adapted for the tropics as malt liquor. Spirituous liquors excite the circulation and brain, and taken in large quantities are calculated to induce directly inflammation of the liver and brain. 7. Tea and coffee are part of the soldier's ration issued by the commissariat. Lemonade, soda water, and similar drinks are not procurable at this station. In my opinion the system requires a certain amount of support to enable it to bear up against the enervating effects of a tropical climate. This remark applies particularly to older residents. 8. It would be beneficial to the health of the troops to suppress the spirit ration, and substitute for it beer, tea, coffee, &c. Beer should not be omitted, but substituted for the spirit ration. 9. 10. It would be most beneficial to prohibit the sale of spirituous liquors in the canteens. Recruits often arrive in India with a positive distaste for spirits, but habit soon reconciles them to it, and in a few years the same man dies a confirmed drunkard through it. Only beer, coffee, tea, lemonade, and perhaps sweet wines, should be sold in the canteens.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	11. There is no canteen at this station. The bazaar is under the civil authorities. There is a rule prohibiting the sale of spirits to the soldiery, but it is, and always will be, most difficult to prevent its evasion.
VI. Diet.	1. The composition of the ration for Queen's British troops and European troops in the Indian army is the same, and consists of— Bread - - - - 1lb. Meat - - - - - 1lb. Rice - - - - - 4oz. Sugar - - - - 2½oz. Tea - - - - - ⅝oz. Salt - - - - - 1oz. Vegetables - - - - 1lb. Firewood - - - - 3lb. Beef is given five times a week, and mutton twice. The vegetables consist of such description as may be procurable at the different stations of the army according to season. Potatoes are issued twice a week. Coffee may be substituted for tea at the rate of 2lb. of coffee for 1lb. of tea. In the Madras army the rations are inspected daily by the orderly officer previous to issue, if found bad he immediately reports the circumstance to the quartermaster, who has the immediate charge and responsibility of their issue; and should any article be deficient either in quality or quantity he is enjoined to make an immediate report to the Commanding Officer, who causes a committee to assemble and report on them. 2. Whenever European troops in transit embark from or disembark at this station, they are provided with a complete ration with the proportion of vegetables, but no fruit is issued to them. The stoppage is 3 annas 4 pice, equal to 5*d.* English money. When the cost of the ration falls below this sum, the difference is disbursed to the soldier. They have three meals a day; breakfast at ½ to 8, composed of tea, bread, and any other article the soldier gets for himself; dinner at ½ to 1, consisting of mutton or beef, with rice, onions, and vegetables; and an evening meal at 4 p. m., same as breakfast. The vegetables are English potatoes twice a week, and country (sweet) potatoes five times a week. The proportion of vegetables entering into the constitution of a ration is one pound. 3. The bread is the best white and the meat of the best description of grass-fed cattle. No improvements to suggest in the ration. The sepoy, when on foreign service, that is in Pegu, China, the Straits, &c., is rationed by the Government, and it is not an uncommon occurrence for the most penurious to sell (to the great detriment of their efficiency and health,) a portion of their rations; but as each company of a British regiment is divided into messes, this cannot be done by the English soldier. The sepoy, on the contrary, cooks and eats alone, and it is difficult to prevent him selling his ration, if so determined, unless native officers of a similar caste were obliged to inspect the meal, and this could not be always done. 4. Kettles and copper boilers are the means used for cooking. Every sepoy has of course his own cooking utensils and provides his own food, with which no one ever dreams of interfering. All the replies to these questions on diet refer exclusively to European troops. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. The food is boiled. For the convalescent soldiers at this station food is properly done, and is varied according to the taste of the men. Tea and coffee are properly prepared. It is believed soldiers have coffee given to them before a march, but there being no European regiment here the question cannot be answered positively. 5. As this place is not a permanent station for European troops, gardens for the cultivation of vegetables are not required; but it may be here remarked, that potatoes, the favourite esculent of the English soldier, are only grown at a few places in this Presidency, the price at any distance from these localities is beyond the soldiers' means. In every district there are hills of sufficient elevation, it is thought, suitable for the growth of the potato, but the cultivation would have, in the first place, to be commenced by Government. Where successful, it would doubtless be carried on by the cultivators for their own benefit, for the vegetable is becoming of common use among opulent natives.
VII. Dress, Accoutrements, and Duties.	1. The sepoy's dress consists of a scarlet cloth tunic, Oxford mixture woollen trousers, linen trousers, and white linen jackets, and when proceeding on foreign service he has a woollen great coat. The accoutrements are, a shoulder belt, to which the pouch is attached, and a waist belt for the bayonet. He has sandals on his feet. The head dress is a sort of shako, made of basket-work, covered with black wax cloth. The dress of the European and native soldier has lately undergone great improvements; they are now supplied with loose tunics, and the former with a serviceable and light helmet, affording good protection from the sun. The head dress of the Madras sepoy is heavy and clumsy, and interferes with his efficiency; but it has been retained on account of caste prejudices. His musket is also too heavy for his physique; a light fusil is better adapted for his strength. The guard dress consists of the usual uniform, with the addition of a great coat at night to protect him from atmospheric influences, and a sentry box to protect him from rain.
Duties.	1. Troops should be thoroughly drilled at home before being sent to India. 2. The sepoy, at this station, goes on guard once in five days; his turn of duty lasts for 24 hours. He is drilled five mornings in the week for one hour, which exercise has a beneficial influence on health. The best hours for drills, parades, and marches is early in the morning, so that the duty may be got over before the sun acquires any strength, viz., in this latitude by seven o'clock. There are general orders on the subject. Four is the average number of nights the men have in bed during the week. 3. A few guards mount at 3½ miles from the lines; the remainder are close. Guards last 24 hours: 12 by day and 12 by night. There are two roll calls, one at mid-day and one at eight o'clock, p.m. No precautions are requisite at this station as regards the protection of night guards.
VIII. Instruction and Recreation.	1. The questions under this head refer solely to European regiments, and not to native troops. 2. Confinement is much felt by everybody in India, and more so by the British soldier during the hot months, confined as he is to a crowded barrack room, and leads him to dissipation and recklessness. It would ameliorate his condition if large lofty sheds were erected near

SULIPATAM. MADRAS.

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	all barracks, under which he could lounge about, smoke, play at single stick, &c., and amuse himself; if to this were added swimming baths for the hot, and gardens for the cold season, they would, it is thought, add to his contentment and consequent health, and therefore be a positive gain to the State. 3. Anything that tends to make the soldier careful must be advantageous, and savings banks would make him so. Many of the sepoys of the 12th Madras Native Infantry, when in Pegu, lodged their savings in the Government savings bank. This was during the mutiny in Bengal; an incontestable proof that they had neither sympathy with the mutineers nor fear for the stability of the Government. 4. There is not at this station sufficient shade for the men to take exercise during the day without injury to their health. If men of European regiments were enabled to do so, it would ameliorate their condition in India immensely.
IX. Military Prisons.	1. There is no military prison at this station.
X. Field Service.	1. There are no local regulations for field medical service not included in the General Presidency Regulations. 2. The medical officer is always consulted and his advice followed in the selection of encamping grounds. 3. The highest and best drained ground and the one most exposed to a free circulation of air is invariably selected for camping. The tents are systematically arranged, the ground in the neighbourhood kept clear, and water supplied from the best wells by the water carriers. The medical officer has a general voice in these matters. In passing towns where epidemics prevail communication with the camp is prevented, and, if possible, a detour made in the march. No improvements to suggest. 4. The arrangements for field hospitals, transport of sick, and hospital supplies, are embodied in the medical code of regulations. The sick are conveyed in carts or doolies (a sort of litter) according to the nature of the man's state. A native regiment is supplied with one dooly per company and one sick cart; the field medicine chest is carried by porters.
XI. Statistics of Sickness and Mortality.	No replies under this head.
XII. Hospitals.	1, 2. The European hospital is situated in the fort, close to the barracks, but as this building is to be appropriated to civil purposes, any further description is unnecessary. The native hospital is situated close to the sepoy place of arms, and adjoining the lines; it is about two miles from the bazaar and houses of the native civil population. The site is open and freely ventilated, and there is no impediment to the free circulation of air, it is generally healthy. 3. The water supply is abundant and of good quality. 4. The refuse water percolates though the sandy soil. 5. The floors of the wards are raised two feet above the surrounding level, but there is no free perflation of air underneath them. The roof-water sinks into the sub-soil, there is no guttering round the hospital. When the rain falls rapidly, the water collects into pools, but gradually removes by evaporation and absorption. The hospital is built of brick and lime; the walls and roofs are single; and the tiles with which the roof is covered, add considerably, by reflected heat, to the temperature of the building. It has verandahs on both sides, six feet in breadth, which afford adequate shelter from the sun's rays. They are not used for the accommodation of sick, convalescents or others, except when epidemics are prevalent and there is an inordinate number of sick. The hospital consists of one flat. Table of hospital accommodation :— The date of construction is not known. Total number of wards,—8 in European hospital. No regulation as to the number of beds per ward.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.			Ft. in.		Feet.	Ft. in.
European Hospital in Fort, 8.	13	42	17	13	9282	1,000	221	1 8	36	6	4 6
Native Hospital for sepoys, 1.	40	80	18	.10	14400	360	36	1 8	10	4	.3 0

The hospital is so placed as to receive the full benefit of the prevailing winds. The windows open inwards, and their arrangement and construction is conducive to ventilation and coolness.

6. Ventilation is effected by means of the doors and windows, and is sufficient to keep the air pure. There are no jalousies or jhilmils.

7, 8. There are no artificial means in use for cooling the air of wards or of warming them. The walls and ceiling of the European Hospital are whitewashed once a year, and those of the native hospital once in two years.

9. The privies of the native hospitals consist of a brick and chunam seat with a circular opening, under which an utensil is placed. There are no urinals in use with native hospitals. The contents of the privies are emptied at stated periods, and the filth carried away; they are not offensive.

10, 11. There are no lavatory arrangements in the native hospital, nor are there any bathing conveniences for the sick supplied.

12. The hospital linen is carried away by the regimental washermen. The conveniences for washing and drying are sufficient.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	13. The storage is sufficient and dry. 14. In the native hospitals, iron bedsteads are used; mattresses and pillows are supplied. No improvement can be suggested. 15. The kitchen in native hospitals is used almost exclusively for preparing hot water for decoctions, fomentations, &c. 16, 17. No replies to these queries, as they relate to European regiments. 18, 19. The sanitary condition of the hospital is good. No improvements to suggest. 20, 21. No replies to these queries. 22. There are no local hospital regulations at this station. 23. With regard to the powers of the medical officer as to the sanitary state of the hospital, &c., he is in every respect paramount, except as relates to repairs in buildings, which depends upon the confirmation of superior authority. 24. There are no convalescent wards at the station; they are not required for native troops.
XIII. Burial of the Dead.	1. The burial ground used by British troops is in the fort, at 3½ miles from the station. Other Europeans are generally buried in the graveyard surrounding St. Mary's church, in the station. The burial ground in the fort, and in the station, is favourably situated with regard to the prevailing winds, which pass over the cantonment before reaching the burial grounds. 2. Its area, 34,161 superficial feet. The soil and subsoil is sand and clay. Water is absorbed by the soil, and decomposition readily takes place. The ground is well kept. 3. There is no regulation interval between the graves; the grave space is six feet by three feet, and the depth six feet. They are never re-opened. The hour of interment for Europeans depends on the hour of death. Every man must be examined post mortem. If a man died at early morning, he can be buried in the evening; but if in the middle of the day or afternoon, not till the following morning. During epidemics no unnecessary delay in interment is allowed. The native burial grounds are on the outskirts of the town, there are none in the station. Native interments are not interfered with; during epidemics, they get rid of their dead as quickly as possible. 4. The graveyard is never offensive. 5. The dead of the camp followers and bazaar people are burnt, if Hindoos. The Mahomedans bury their people in an appointed place near the native town. 6, 7. No injury accrues to the public from the present practice. No improvements are suggested.

(Signed) G. Allan, Major, 12th Regiment Native Infantry, Commanding Masulipatam.
J. A. Horak, M.D., Surgeon, 12th Regiment Native Infantry.

16th March 1860.

PALAVERAM.

Accommodation — Queen's Troops. Artillery Veteran Company Barrack accommodates 46 men. Native Troops. Infantry, Native Infantry Depôt, generally amounting to 1,500, or accommodation for two Native Infantry Regiments.

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is generally flat. The cantonment is situated on open ground on the north-west side of two rocky hills, between which there is a narrow gorge. The soil is sandy, with a subsoil of clay, beneath which, at a considerable depth, there is a bed of limestone and granite. During the heavy rains in November and December the cantonment (the south and east side especially) is frequently submerged for days. There is no jungle, but here and there are topes of mango and palmyra and some rows of fine trees. There are a few tanks. 2. The station is about 35 or 40 feet above the sea, and on a dead level with the surrounding country for many miles. In the rainy season the river and tanks overflow; they are then nearly on the same level as the station. The ground rises towards Chingleput and Arcot, both of which are military stations. Arcot was formerly the station of the native infantry depôt, but Palaveram is more convenient to the port of Madras, and therefore better adapted. 3. The Mysore table land is the nearest, and there are no hills of any extent nearer than the Neilgherries. 4. The sea is about 5 or 6 miles distant from the station. There are some large tanks on the land side, and the river Adyar about a mile off. During the rains the tanks and rivers may overflow, but they cause no damage. The water of the rains is speedily removed on their cessation, although the hospitals are under water for two or three days at a time. The station is surrounded by waste ground and paddy fields, but these do not appear to influence health. 5. The station would be open were it not for the two hills on the sea or south side, which in a great measure exclude the sea breeze or only cool wind, whereas it is quite exposed to the land or hot winds. These hills are 500 to 600 feet in height, and covered with large blocks of granite, with a very scanty vegetation. They reflect the sun's direct rays and interfere with ventilation. This is one of the hottest stations in India, and the thermometer is seldom below 80°, but natives appear very healthy in it, and the European veterans do not complain much. The sea breeze is very grateful during December, January, and February. 6. Some lands are employed as rice fields, but the greater part is waste land. There are no works of irrigation near the station. There is no restriction as to the cultivation of rice, but none is grown within the limits of the cantonment. There is no cultivation of indigo, nor is the preparation of hemp or flax carried on near the station. 7. Madras is 12 miles distant from the station. 8. The soil of the district is sandy and is of variable depth. The subsoil contains clay and is mixed with fragments of granite. It has been a military station many years.

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References to Subjects and Queries.	Replies.
I. Topography—*cont.*	9. Water is found during the dry season about 30 feet below the surface, and during the rainy season at the surface. 10. Some of the rain water may reach the sea, but the greater part is either absorbed into the subsoil or removed by evaporation. There are numerous nullahs, which assist considerably in the drainage. Some of the drainage from the two hills flows into the cantonment. 11. Water for the domestic purposes of the station is derived entirely from wells. There are no tanks of any extent within half a mile of the station. There is a tank about 3 miles in circumference about half a mile distant on the south-west, and one of some 10 or 12 miles circumference 5 miles distant. These never entirely dry up. A small one in the north-east of the cantonment generally dries up in April. The nature of the plants and animals they contain is not known. Tank water is not used for drinking purposes. All the water used for drinking purposes is taken from good wells containing no impurity. No nuisance or malaria proceeds from any tank without the station. 12. The wells at the station yield an abundant supply of water, colourless, tasteless, and inodorous. The chemical composition is not known. Some of the springs are softer and better than others, but generally the water is very good and wholesome. There are a few wells in which the water is brackish, containing lime and chloride of sodium, but these are not used. The water is raised in leathern buckets and distributed by bheesties. 13. The station appears well suited to natives, and their lines being at some distance from the hills are not affected by the reflected heat from which the officers are great sufferers. 14. No knowledge of the amount of inquiry or examination as to topography, &c. previous to the selection of new stations.
II. Climate.	1, 2. There are no means or instruments available at the station for conducting and registering meteorological observations. 3. The climate is generally dry, except during March and April and the autumnal monsoon. The heat is very great all the year, there being no cold season. The coolest time of the 24 hours is about one hour before daylight. The observations of the Madras observatory would apply here, except that the air here is always much closer. Almost all the duties here are taken by natives. December, January, and February are the most healthy months to Europeans, there being no appreciable difference between the other months. By the records of admissions during the last 10 years I find that no particular type of disease prevails at one season more than another. 4. There is no district near the station the climate of which is more conducive to health than that of the station. 5. Not sufficient data to answer the question as to the salubrity of the stations at which the officers had served.
III. Sanitary Condition of Station.	1, 2, 3. A tracing of the station and adjacent country, &c., is transmitted. 4. Table of barrack accommodation. Date of construction, A.D. 1824. Total number of rooms, 1. Total regulation number of non-commissioned officers and men, 46.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superfical Area in Feet per Man.	Height of Men's Beds above Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft. in.	Ft.	Ft.	Ft.			Ft. in.		Ft. in.	Ft. in.
1 Long Room -	46	186 . 9	18	15	50,220	495	33	2 2	20	5 6	5 6
Guard Room -	—	41 0	18	15							
Prison Cell -	—	12 0	18	15							

5. The windows are on opposite sides and open outwards. There is a verandah on both sides, but not at each end; the dimensions of the side verandahs are each 186 feet in length and 8 feet in breadth. They are generally used as sleeping quarters during the hot weather by the occupants of the barracks. There are shutters, but no jalousies or jhilmils.
6. Wooden cots composed of 3 planks on 2 trestles are used in barracks. The bedding is of cotton, with sheets and blanket provided by Government at certain periods. No improvement to suggest.
7. There are no tents in use.
8. The ventilation of the barracks, &c. is effected by means of the doors and windows only, and is sufficient to keep the air pure night and day. The air of the barrack rooms is cooled by punkahs hung down the centre of the barrack, which are pulled at Government expense.
9. The barracks are constructed of brick and chunam, and No. 1 has a double roof, tiled outside. The huts for the native infantry are built of mud; some are thatched and some tiled.
10. The floors are paved with stone flags, and are raised about 3 feet from the ground. There is no passage of air beneath.
11. The materials and construction of the barracks, &c. are suitable for the climate. They are kept in repair by the district engineer, by whom all repairs are immediately executed when pointed out by the commanding officer. The walls and ceiling are cleansed and whitewashed once a year.
12. There are two lavatories in No. 1 barracks, and a separate building contains a plunge bath; both are well supplied with water.
13. The cookhouse attached to No. 1 barrack is 24 feet by 16 feet. It is fitted up in the usual manner; water is supplied by puckallies. There is no means of draining away the refuse water. No conveniences are required for washing and drying linen, all washing being done by natives beyond the station.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	14. There is but one privy attached to the barrack, it is 14 feet by 10 feet. There is no drainage; the ordure is carried away daily by sweepers. There are no urinals. 15. There are no windows in these buildings, but ventilation is affected by honeycomb tile-work. The barracks are lighted by oil lamps suspended from the roof. 16. There are no arrangements for draining and sewering the barracks. The drainage for the two lavatories and plunge bath is allowed to run out and sink into the subsoil. None of the buildings are damp. Rain water is mostly carried away; all other refuse fluids either evaporate or sink into the subsoil. There are no cesspits or foul ditches. 17. The general surface cleansing is performed by the employment of two scavenger carts, supplied by the commissariat contractor; they are not sufficient for the work required, for not only have they to remove the refuse, dirt, leaves, manure, &c., from the bazaar and streets of the cantonment, but also to attend at the barrack, hospital, and patchery. The refuse is uncarted on the plain in rear of the hospital, and is used up in the gardens existing in that neighbourhood. 18. The surface of the cantonment is kept as free as possible from vegetation, yet prickly pear exists in patches, though it has been much thinned of late years. There are no old walls, hedges, &c., to interfere with the ventilation of the station, bazaar, &c. 19. The bazaar is generally well drained, but the drains are not covered in. The water supply is abundant, and the ventilation is good. There is no crowding. Cleanliness is not sufficiently attended to, for the reason given in question 17. It is the duty of the superintendent of police, assisted by the cutwal, duffadar, and police peons, to inspect the bazaar, and punish all infringements of its rules. As regards cleanliness, the employment of an extra scavenger cart would be very beneficial. The general condition of the native houses near the station is clean. There are neither dung-heaps nor cesspits within them. No native dwellings are near the barracks occupied by Europeans. 20. Meat is brought by the commissariat department for the consumption of the European troops from St. Thomas's Mount, distant three miles. 21, 22. There are no bazaar horses. There are no artillery or cavalry stables. 23. The patchery is not sufficiently filled with houses for the accommodation of all the married non-commissioned officers and men of the European veteran artillery company. There are at present 12 families occupying quarters in the barrack of the company.
Officers' Quarters.	1. There are no officers' quarters. The officers reside in rows of bungalows, running nearly east and west; the greater number being on each side of the trunk road from Madras to Trichinopoly.
IV. Health of the Troops.	1. The natives are generally healthy in and around the station. 2. The diseases most prevalent among the native population are, remittent and intermittent fevers, diarrhœa, dysentery, itch, dyspepsia, and syphilis. 3. The healthiness of the neighbouring native population is attributable to the fact that the villagers near this station are principally employed in the cultivation of rice, which appears a healthy occupation, and they are much less exposed to causes productive of disease than natives resident in military stations. They are nearly all Hindoos. 4. This question is not applicable to this station; where the veterans have come from cannot be stated; some probably from every station in Southern India. The N.I. depôt is composed of men returning from active or foreign service, and recruits waiting to join their regiments. No portion of the men's accommodation is more unhealthy than the rest. 5. Troops are never camped out. 6 to 17. No knowledge of hill stations. 18. Sandy soils with clay subsoils are generally the most healthy for stations, especially if not impregnated with iron. They are, however, very hot and disagreeable to European troops in windy weather. 19. When a recruit has ceased growing, and his limbs are firmly set, he is as well adapted for Indian service as he ever can be; he attains this stage about 19 or 20 years of age. The best period for troops to land in India is the three last months of the year; they then have the benefit of two or three cool months before the excessive heat. Recruits should be sent to cool stations (such as Bangalore), until they are taught their duties, and the peculiarities of Indian life. The change in their mode of living is then acquired in a manner less repugnant to their ideas. 20. With regard to whether troops should be sent direct from the home depôts to India, or sent to an intermediate station for a certain time; troops sent direct from England do not appear to suffer more than those coming from intermediate stations, and they generally bear the heat of the first summer better than any succeeding one. Cannot say whether they should be sent to hill districts on landing, to accustom them to the climate. 21. When a Queen's regiment arrives, it is marched to its station by stages, if no railroad exists. Queen's details are marched to their depôt, as also are Indian artillery, but local infantry are sent to their depôt by rail. 22. As regards the number of years a British soldier should serve in India, few are fit for active duty after 20 years' service. The average age of the European veterans here is 42, at which age they generally look old worn-out men. Two years in this part of India does more to age a man than three in England. 23. No suggestions to offer as to the mode of conducting the business of medical boards, with reference to invaliding. 24. Not sufficient experience as to the time of year invalids should leave India for home.
Diseases.	1. There are no regular inspection parades among the Europeans, for the discovery of incipient diseases at this station. Among natives there are weekly inspections at daylight in the morning, principally for the detection of itch. 2. There has been no scorbutus or scorbutic disease among the troops at this station. 3. Among the European veterans hepatic disease is very common, but as they usually have it at the time of being transferred to the non-effective establishment, any tabular statement would manifestly be useless. The men subject to it are what I may call "steady drinkers;" men who always take half a pint of arrack a day, but who do not get drunk. 4. Dracunculus is very uncommon. I cannot find a case in the books as having originated in the station; all in the depôt hospitals are imported from the Straits and Burmah. 5. The Europeans of the artillery veterans are nearly all married men. Venereal disease is exceedingly rare among them. Of the doing duty men of the N. I. depôt, about five

PALAVERAM, MADRAS.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	per cent. of the admissions are from venereal disease, which might be almost altogether removed by the establishment of lock hospitals. 6. Amongst the troops at the station the prevailing diseases are,— *Fevers*, particularly remittent fever, which is very common. The children of the European veterans suffer especially. *Dysentery* sends a few sick into hospital from the station; by far the larger number of admissions being transfers from foreign service. *Cholera* has never prevailed; only a few sporadic cases having occurred. The same may be said of *small-pox*. *Rheumatism* is very common among the native troops, but from the foreign service sick being always included upon the depôt books with the station sick, no per-centage returns would be fair to the station. The total admissions in the last year in the veteran company is 70, of which number 3 men have died; two from cholera, one from apoplexy. In the depôt hospital there have been in the last 12 months 1,698 admissions, and 65 deaths, 33 of which were from dropsies and bowel complaints. 7. Intermittent and remittent fevers, and bowel complaints, prevail at all times of the year, both among the Europeans and natives. The diseases of the veterans are more to be attributed to their long residence in the tropics, and their mode of life, than to atmospheric phenomena. Their children suffer from croup and hooping-cough, during the months of January and February. Itch is the most universal disease among natives, few being free from it. Beri-beri symptoms are very common among the native troops, but they are generally to be traced to a residence in Burmah or the Straits. Itch is the only disease that can be traced to crowded houses and dirty habits. The bazaars are clean. 8. There has not been an epidemic at this station for many years, and the troops neither march nor take the field. 9, 10. Small doses of quinine have not been tried at this station as a prophylactic against malarial disease. No recommendations to suggest.
V. INTEMPERANCE.	1. The European veterans take on an average about half a pint of arrack daily, and although there are many intemperate men among them, there are no confirmed drunkards. Among the native troops the crime of drunkenness is almost unheard of. 2. Rather more than one-fifth of the admissions during the past year into the European hospital were from diseases "directly" the result of intemperance; but I have not sufficient data to give the "indirect" admissions, or to prepare the statistical table required. Drunkenness is always punished as an offence. 3. Arrack is sold at the canteen to the extent of the regulated allowance to all veterans; nearly all of whom take their two drams daily. It is also sold in the bazaar, but only to natives. As to whether spirit is any part of ration for soldiers, at the station, on the march, or in the field, so much of this question as is applicable to this station is answered in the canteen regulations, a copy of which is appended (Intemperance, 11.) The veterans are so accustomed to their two drams a day that they could not do without it. When a man is discharged from the hospital convalescent he gets his drams unless stopped by the medical officer. No drinks injurious to health other than intoxicating drinks are sold at the canteen or bazaar. 4. In such a relaxing climate stimulants are necessary to health. The wives of the veterans are therefore frequently permitted to draw one dram from the regimental canteen. It is (in moderation) conducive to efficiency and internal discipline. 5. It would be most injurious to abolish the use of spirituous liquors as part of the ration. If the canteens were closed the men would get spirits, through natives, of bad quality. 6. A change of malt liquor or wine from spirituous liquors would be beneficial to health. Here the men who prefer wine or beer have the option of taking it. 7. Coffee, tea, lemonade, &c., are much used at the station. On account of the heat they are quite necessary, but beer and spirits are taken as well. 8. It would be most injudicious at this station to abolish the spirit ration altogether and to substitute for it beer, tea, &c. 9, 10. The veterans being nearly all married men keep their drinks in their own houses. I think that any attempt on the part of military authorities to curtail the allowance of spirits that these men have been accustomed to since their first arrival in the country must fail. But if ice were supplied to the canteens at a cheap rate I am sure it would have a beneficial effect, as hot beer or lemonade are not by any means enticing fluids. Ice is supplied to the European hospitals at many stations for the sick, why should it not be given to keep men out of hospital? 11. The following are the more important of the canteen regulations:— "3. Men of one corps are not to be admitted into the canteen of another without the sanction of the commanding officer of each corps. "4. Station and other staff non-commissioned officers who may obtain permission to frequent regimental canteens, being permitted, through the regulations of the service, to draw their arrack from the commissariat department, are not under any circumstances to be allowed any spirits in the canteen. The issue of spirits to men who may be admitted into the canteens of other corps is likewise prohibited. "5. No person who may appear intoxicated is to be permitted to enter the canteen, nor is any man to be allowed to remain there who is not perfectly sober. "6. Women are not allowed to enter the canteen. "7. All canteens are to be open daily for the issue of coffee, tea, cheroots, &c., from gunfire in the morning till 8 a.m., from 10 a.m. till ½ past 12 noon, and from ½ past 1 till ½ to 8 p.m. (excepting on Sundays, when they will be closed during divine service). Issues of arrack, wine, and malt liquors will be made during the hours specified in the following

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	table, excepting under the provisions of paras. 26, 27, and 29; issues of these articles at any other hours are strictly prohibited.

Articles.	Hours of Issue.	
	Early Issues.	Evening Issues.
For Beer and Porter only	From 10 a. m. till half-past 12 noon.	From 6 till a quarter to 8 p.m.
Beer, Porter, Wine, and Spirits	From half-past 1 till half-past 3 p.m.	

"No man is to be allowed more than one-half of the daily allowance of wine and spirits within the same period of issue.

"The canteen is to be shut one hour before any regimental parade, and a quarter of an hour before any appointed roll calling.

"When the canteen is situated within the precincts of the barracks, it may be kept open until 9 p.m. for the issue of tea and coffee, &c., at the discretion of, and under such restrictions as the commanding officer may consider necessary.

"After the canteen shall have been closed for the night, no person is to be admitted until the following morning, the fixed time for opening it.

"The maximum issue to any one man in one day is as follows:—
Spirits 2 drams, but no malt liquor or wine;
Spirits 1 dram, with 1 quart malt liquor, or 2 drams of wine; or
Wine 4 drams, but no spirits or malt liquor.

"Spirits issued in the canteen are never to be taken from the bar, excepting for non-commissioned officers for the purpose of being made into punch, and the cases provided for by paras. 26 and 29.

"Excepting to the mess tables and for men on duty, the issue of spirits from the canteen to any individual on any pretence whatever is strictly prohibited.

"The measure to be used for the issue of draught malt liquors, is the common pint measure, the cubic contents of which are 28·875 inches.

"One dram of spirits diluted with an equality of water, one quart of malt liquor, or two drams of wine, may be issued to such men as wish it, during dinner in the barracks; hot water is to be provided without charge for those men receiving spirits who may ask for it.

"Staff non-commissioned officers and family men may receive the same allowance of malt liquor or wine, but not spirits, for consumption with their dinners at their own quarters. The abuse of this privilege will involve forfeiture of the indulgence, besides punishment for disobedience of orders.

"Men on duty are prohibited entering the canteen. Those whose canteen liberty may not have been stopped are allowed to receive the authorized quantity of beer, wine, or spirits with their dinner or supper, to be drawn under restrictions, as commanding officers may deem necessary, by orderly corporals on indent form No. 1. The orderly corporal will make liquor over to the non-commissioned officer or corporal of the guard, in whose presence the issues are to be consumed.

"The names of all men who may have been prohibited entering the canteen are to be given to the canteen serjeant by orderly serjeants of companies and troops; they may however be provided at the bar of the canteen with tea, coffee, and cheroots.

"The names of men discharged from hospital as convalescent are also to be given to the canteen serjeant by orderly serjeants of troops and companies; they are not allowed spirits, malt liquor, or wine, except with the written sanction of the medical officer, under counter-signature of the commanding officer.

"No games are to be permitted in the canteen on Sundays.

"Chess and draughts are allowed in the canteen, but no cards or dice; and gambling of every description is strictly prohibited.

"No arrack or country made spirits, except as furnished by the commissariat, will be allowed in canteens; and it is at all times discretionary with the commanding officer to exclude spirits of every description altogether from the canteen, making arrangements regimentally for drawing arrack from the commissariat department for such men as may wish their daily allowance.

"The prices of all articles supplied by the canteen, and the rules for its guidance, are to be hung up in a conspicuous part of the room.

"No supplies of any kind are to be sold in canteens excepting under the orders of the committee.

"Nothing whatever shall on any account be sold or issued from the canteen directly or indirectly to any native, whether a follower of the regiment or otherwise.

"No person employed in the canteen is to be allowed under any pretence to derive profit on the sale of articles by the establishment.

"All liquors or supplies furnished by the canteen are invariably to be paid for on delivery.

"After the accumulation of funds sufficient to meet contingent losses, the savings may be employed, under the direction of the commanding officers, for the benefit of regimental or detachment libraries, mess necessaries, gardens, amusements, in charity to widows and orphans of the regiment, and in aid of the expenses of families on removal from one station to another."

VI. Diet.

1. The daily ration of European troops of the Indian army is,—

Bread, 1 lb.	Salt, 1 oz.
Meat, 1 lb. either beef or mutton.	Tea, $\frac{5}{7}$ oz.
Vegetables, 1 lb.	Coffee, $1\frac{3}{7}$ oz.
Rice, 4 oz.	

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References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	N.B.—Beef is supplied five times a week and mutton twice; tea five times and coffee twice during the week. The serjeant and orderly corporal of the day inspect the ration. On the occasion of any complaints a committee is assembled. 2, 3. No fruit is supplied, but in other respects a complete ration is provided at the usual rate of 3 annas 4 pice per diem. There is no regular mess in the European veteran artillery company. The proportion of vegetables is 1 lb. per diem. No improvement suggested. No arrangement exists for preventing any part of the rations being disposed of by the troops. 4. The majority of the rations are cooked at home. The cookhouse of No. 1 barrack has already been described (Sanitary Condition of Station, 13.). There being no chimney in the kitchens, they are dirty, dark, badly ventilated; water is supplied by puckallies. The food is both boiled and roasted. Cannot say whether the cooking is properly done or sufficiently varied. The men have tea and coffee, &c. before a march. 5. Gardens for the cultivation of vegetables by soldiers are already established under the orders of Government.
VII. DRESS, ACCOUTREMENTS AND DUTIES.	1. The component parts of the soldier's dress are, a helmet made of wickerwork covered with calico, cloth tunic, and trousers of the same material. During the cold season they have woollen clothing and cloth caps. The present dress is suitable to the climate and for soldiers' duties by day and night. No improvements to suggest.
Duties.	1. It is advisable, in my opinion, as regards the health of the men, that they should be thoroughly drilled at home, as it would save a deal of sun exposure to the recruit on his arrival in India. 2. The usual routine of a soldier's duties are, parade twice a week, roll calls daily. The guards here do not come round oftener than once a week. This is a great relaxation after their duties in Fort St. George, for which they are detailed and relieved monthly. The best hours for drills, parades, and marches is before sunrise. The men on an average have six nights in bed during the week. 3. The barracks are 150 yards from the quarter guard, which is relieved daily. There is a roll call every day at 5 p.m. With reference to the effect of night guard on health, the men of the company are all well-seasoned men.
VIII. INSTRUCTION AND RECREATION.	1, 2. There is no ball court or skittle-grounds, but there is a school with a good 3rd-class schoolmaster; also a very good library and reading room, open every day, but not lighted at night. There is no day room or soldiers' clubs. There are several soldiers' gardens; and ground to the rear of barrack is granted to all soldier applicants. There are no workshops, neither is there a theatre or gymnasia. The reading room is much appreciated by the men during the heat of the day, as well as at other times. There is no restriction on the men as to exposure to sun and rain out of the barracks when off duty. No suggestion to make as to the existing means of recreation and employment. 3. The institution of soldiers' savings' banks would be very advantageous. 4. There is a great deal of shade, but not sufficient to enable the men to take exercise during the day.
IX. MILITARY PRISONS.	1. There is one prison under the same roof as the canteen and guard. It is not well ventilated and requires windows; there are ventilators at the top of the prison, but very little light can penetrate. There are besides two solitary cells, containing compartments for two prisoners each. They are built on the same plan as all others existing at every station in this presidency.
X. FIELD SERVICE.	1. There are no special local regulations for field medical service not included in the general Presidency Regulations. 2, 3, 4. No reply to these queries, the questions not being applicable to this station.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.
XII. HOSPITALS.	1, 2. The hospitals are situated in one row and (for the treatment of the sick) are two in number—one being for the worst cases of the men returned from foreign service (natives), the other being the European hospital, to which is attached a small room for women and children. These are in the immediate rear of the veteran company patchery. There are no stables. The bazaar is a considerable distance away, as also the houses of the civil population. There are two other hospitals, generally filled by sepoys returned from foreign service, and not requiring treatment. The site of all these buildings is open and well ventilated, but the ground is low and in the rainy season under water, a great deal of the rain falling in the patchery draining down towards the European hospital. 3. The water supply is abundant and of very good quality. 4. The drainage is very bad, and from the low position it is very difficult to improve it. The impurities of the hospitals are removed by toties, one being attached to each building. These men carry away all filth and refuse matter to such a distance that no bad smells are observed. This system appears to answer well. The hospitals are all of the same size, shape, and capacity. The description of one is therefore sufficient. 5. The floor of the building is raised about two feet above the surrounding ground, but fresh air does not freely circulate under it. There is no provision made for conveying away the roof water. Rain water must either evaporate or sink into the subsoil. There is no drainage or guttering sufficient to remove rain-fall rapidly. The hospitals are built of brick, with tiled roofs. The walls are single and of sufficient thickness. The roofs are single; if they were double, the heat would be much less. There is a verandah on each side of the hospitals 70 feet long by 10 feet 10 inches broad. These are sufficient to protect the hospital. In

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	the European hospital the verandahs are never used for the accommodation of sick or others, but in the N. I. (central) hospital they are used for itch cases and some other slight complaints when the ward is full. The hospitals consist of one flat.

Table of barrack accommodation.
Date of construction, 1824.
Total number of wards, 1 to each hospital.

Wards or Hospital Huts.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
For European Artillery Veteran Company, one hospital (one ward); there is also a small room for women and children. For N. I. depôt, one hospital for sick, and two for convalescents; all the same size.	There is no regulation number of sick. Each ward will hold 30 beds easily. In the hospital of the N.I. depôt, the number is sometimes increased to 46. It is then however crowded.	Seventy feet.	Eight feet.	Average height of room, 10 feet. The roof slopes.	22,275 feet.	Never less than 484.	This will depend on the number of beds in use. A bed covers about 24 feet of ground.	Average 20 inches. The wooden cots are higher than the iron ones.			

The hospital is so placed as to receive the full benefit of prevailing winds. The hills before mentioned may interfere a little, but they are at a considerable distance. There are no windows. The jalousies and doors take their place.

6. Free ventilation is kept up by means of three doors and two jalousies on each side, and two doors at each end of the building. The jalousies consist of two Venetian shutters on a framework, 4 feet by 1½.
7. There are no regular means of cooling the air admitted into the wards, but punkahs are kept going during the hot season.
8. There are no means of warming, as it is not required. The walls and ceilings of hospital wards are cleansed and whitewashed once a year, but oftener if deemed necessary by the medical officer.
9. The privy is a brick building with a tiled roof, situated 40 yards from the western side of the hospital and measuring 10 feet by 8. Urinals consist of earthenware vessels. The urine, &c. is carried away by toties. The filth is carried away, it is not offensive.
10. The sick have large tubs in hospital, back verandah, or some of the outhouses for lavatory purposes. Those who are very ill are washed in the ward by the attendants.
11. There is an excellent plunging bath under cover in an outhouse, the water of which is changed as often as required. The means of bathing are ample.
12. The washing and drying of hospital linen is conducted by a dhoby on the hospital establishment.
13. The storage is sufficient and dry.
14. In the native hospital the cots are of two kinds, some iron, some wood-taped, the latter being most convenient for patients with bowel complaints. In the European hospital, they are all of the latter kind, and each is furnished with a quilt, two pillows, and a blanket.
15. The cook-room is situated about 20 yards to the rear of the hospital, and is well provided with coppers, baking-tins, and earthenware vessels. Native cooks are supplied by the commissariat department, and no fault is found with the cooking. Whatever is ordered can be supplied.
16. Diet tables, &c., according to regulation.
17. The provision for attendance on the sick in the European hospital is, one serjeant, one nurse, and five menials, which is sufficient. In the native hospital, one havildar, one naick, twelve orderlies, one dhoby, one toty. The number of orderlies may be increased at any time.
18, 19. The hospital is very healthy. No epidemic diseases ever appeared in either European or native hospitals. No improvements to suggest.
20. Convalescents take exercise near the hospital at daybreak and sunset. There is very little twilight here, and while the sun is up, it is impossible to walk. There are no shaded walks or seats.
21. There is a small ward for women and children, containing six beds, but it is quite insufficient for the 500 women and children living in the patchery; hence, all who cannot attend as out-patients have to be attended at their homes, where they cannot be properly looked after. A new female ward is required.
22. There are no special local hospital regulations not included in the general Presidency Medical Regulations.
23. In matters appertaining to the sanitary state of the hospital, repairs, and buildings, &c. a medical officer has no power to depart from the rules of the service as laid down; but his suggestions to commanding officers and superintending surgeons are generally attended to, if they involve little or no extra expense to the State.
24. There is no hospital for convalescent Europeans. I do not think one would be an advantage. There is one for natives, who having returned from foreign service require no treatment prior to proceeding on sick leave to their native villages.

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References to Subjects and Queries.	REPLIES.
XIII. BURIAL OF THE DEAD.	1. The burial ground used by British troops adjoins the station on the south-west side. The wind blows from that quarter during March and April. The Catholic burial ground is in a similar position, half a mile beyond. 2. There are about 50 yards of ground in each burial ground actually in use, with two or three times as much to spare. The soil is gravelly and very rocky. No graves have ever been opened, so I cannot state how soon decay takes place. Both the grounds are well kept and neat. 3, 4. The grave space allowed is 6 feet by 3½, and the interval between the graves is 5 feet; the depth is from 5 to 6 feet. Graves are never reopened. Interment is compulsory at ordinary times, from 12 to 18 hours after death; during epidemics, within 8 hours. The graves of Mussulmen are scattered all over the country. A rich man is buried in his own compound. Hindoos are buried near the river. Burning of the dead is performed on the other side of the hill and near the river, but neither from this practice, nor any burial ground, is an offensive smell observed. The regulation with regard to the burial of British troops is, that when a man dies before noon the corpse is buried at sunset; when after noon, at sunrise the following morning. No lime is put in the coffin. 5, 6, 7. The dead of the camp followers and bazaar people are disposed of according to caste or religion. The majority are buried near the river. No injury to the public health accrues from the present practice. No improvement to suggest.

(Signed) W. H. BAYNES, Captain, Commanding Palaveram.
ROBERT W. COCKERILL, Assistant Surgeon, 20th Regiment N. I.
ARTHUR S. MOBERLY, Captain, District Engineer of Chingleput.

April 28, 1860.

CANNANORE.

Accommodation { Queen's Troops - - Infantry - - - - - 1,094
Native Troops - - Infantry - - - - - 1,527

There is not accommodation enough for one European Regiment.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The general aspect of the surrounding country is flat on the coast and sandy along the shore, becoming undulating, and more or less hilly towards the Western Ghauts, which are about 30 miles from the coast. Several streams and rivers flow into the sea from the Ghauts along the coast. The country between this and the station is much intersected by back waters, which all have more or less communication with the sea. In the wet season of the year, from April to October, the more flat and low parts of the district are covered with rain water, but the country is not otherwise of a swampy character. There is a great deal of wood, consisting principally of cocoa-nut trees, jack, betel, cachew, and mango. The jungle grass during the wet part of the year is most luxuriant and coarse, but becomes very speedily burnt up from drought in the dry season. 2. The elevation above the level of the sea is from 15 to 20 feet, according to the state of the tide; it is on the same level with the adjacent country. The nearest back water is about 2 miles off, and about the sea level. No healthier or better spot could have been selected; the position of the European barracks being generally unexceptionable in every way. This natural state has been more or less injured by the greater portion of the cantonment being the property of the Beebee of Cannanore, over which the military authorities have limited power as to removing sources of malaria, and preventing the planting of trees. 3. The nearest mountain land is the summit of the Western Ghauts, bordering on the Coorg, Mysore, and Wynad table lands; they are from 30 to 40 miles off, and average from 3,000 to 4,000 feet in height. 4. The nearest water is the sea, the station being close on the coast. The low grounds in the immediate vicinity of the station and throughout the district are covered with water during the rainy season, which extends over a period of six or seven months. Within the limits of the cantonments there are many old quarries, from which laterite stone has been cut, and in which refuse and vegetable matter accumulate. This is certainly more or less prejudicial; it has latterly been put a stop to. 5. The station is, on the whole, open and freely exposed to the sea breezes, but certain parts of the cantonment are so much covered with cocoa-nut and other trees as to render free and perfect ventilation an impossibility, particularly among the native population. The temperature of the station is not raised by the buildings being exposed to reflected sun heat. During November, December, and January a strong land wind blows from shortly after sunset, until the earth has been sufficiently heated by the sun of next day, when a current almost invariably sets in from the sea. The land wind is prejudicial to health. 6. The surrounding country is cultivated. There are no works of irrigation of any extent, and they have not affected the health of the station. The whole country close round the cantonment is more or less covered with rice cultivation, both dry and wet. A few spots in the cantonment are also allowed to be cultivated, as thereby the ground is kept clean and clear of noxious herbs. There is no cultivation of indigo, nor is the preparation of hemp or flax carried on in the district. 7. The town of Cannanore, containing about 14,000 or 15,000 inhabitants, abuts on the eastern boundary of the cantonment.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	8. The district near the cantonment is on laterite rock strata, generally covered with a red gravel to the extent of from 2 to 8 and 10 feet and more; in other places the laterite crops out. This kind of ground runs in ridges, interspersed with deep muddy flat ground.
	9. Water is found at from 20 to 40 feet below the surface, according to situation and season. In the wet season the water is almost everywhere close to the surface, and the wells are quite full. In the dry season in many places they run quite dry.
	10. There are no surface springs in the vicinity of the station. The rain-fall sinks principally into the subsoil; a considerable portion, however, draining away into the sea. No drainage from higher ground passes into the subsoil of the station.
	11. The water supply of the station is derived from wells. There are no tanks within the station or within half a mile, excepting a few very small ones in the native regimental lines, and another small one close to the northern boundary. They are full most part of the year, but dry up in the months of April and May. They are free from plants, and contain frogs and such like, and, perhaps, murrel fish and other small tank-fish. No tanks used for drinking purposes are also used for bathing. The wells are generally free from impurities. There is no nuisance or malaria proceeding from any tanks within or without the station.
	12. The supply of water is generally ample in the centre of the cantonment, and along near the sea; but in some seasons there is little or no water in the native infantry lines, and it has then to be brought from a great distance. It is quite free from colour, taste, and smell; it is good and not injurious to health. Puckallies and bullocks are employed for raising and distributing the water to the troops. No better means are available.
	13. There are no other topographical points in the station bearing on the health of the troops, not included in the above.
	14. The older stations were, generally, I believe, occupied without much inquiry; attention has lately been paid to these points, as well as to the defensive capabilities; but even with every care, after location, cantonments often turn out different from what could have been expected.
II. Climate.	1. In the garrison hospital there are a pluviometer, an aneroid barometer, a thermometer, and also a wet bulb thermometer. In the hospital of Her Majesty's 66th there are a barometer, a thermometer, and an imperfect pluviometer.
	2. The following Meteorogical Tables are from the garrison hospital, and are the result of nine years' observation.

From January 1, 1850, to December 31, 1858.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain, Inches.	Winds.		Days of Sunshine.	Remarks.
										Direction.	Force.		
January	29·874	82	9·5	87	77·5	—	—	—	·05	N.E., W.	Moderate		
February -	29·730	81·75	8·	86·75	78·75	—	—	—	·15	N.E., S.W., W.	„		
March -	29·628	84	8·	89	81	—	—	—	·3	W., S.W.	„		
April - -	29·675	86	8·	90	82	—	—	—	2·805	W., S.W., N.W.	„		Cyclone, 29th April 1859.
May - -	29·871	85	8·5	88	79·5	—	—	—	14·4	W., S.W., N.W.	Monsoon.		
June - -	29·939	80	6·5	83	76·5	—	—	—	34·7	S.W., W., N.W.	„		
July - -	29·849	79	6·25	83·25	77	—	—	—	34·905	S.W., W., N.W.	„		
August -	29·845	79	4·	81·5	77·5	—	—	—	15·3	S.W., W.	Gales.		
September -	29·754	79	5·5	82·75	77·25	—	—	—	5·15	W., S.E., S.W., N.E.	Moderate		
October -	29·797	80·5	8·	84·25	76·25	—	—	—	10·305	W., S.W.	„		
November -	29·799	81·75	10·	87	77	—	—	—	2·605	W., S.W., S.E., S.	„		
December -	29·985	81	9·25	86	76·25	—	—	—	1·7	W., S.W., S.E., S.	„		
Mean Annual	29·812	81·5	7·25	85·75	78·5	—	—	—	122·45				

3. The climate at this station is on the whole equable, but occasionally changeable and chilly; during the wet season it is moist and debilitating. Residence on this coast for an extended period is productive among Europeans of great loss of tone and debility generally. The diet ought to be nutritious and mildly stimulating. The clothing ought to vary with the season, but flannel under-clothing is necessary at all times. The drills and exercises ought to take place early in the morning, or late in the afternoon; during the wet season these ought to be had under cover. The most unhealthy months at the station since the arrival of Her Majesty's 66th Regiment have been May, June, July, and August; and the most prevalent diseases at these times have been fevers, bowel complaints, and pulmonic diseases.

4. There is no district near the station the climate of which is more conducive to health than that of the station.

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	5. Brigadier FitzGerald has served at—1, Trichinopoly; 2, Samulcottah; 3, Secunderabad, three times; 4, French Rocks; 5, Bangalore, twice; 6, Cuddapah; 7, Ghooty; 8, Masulipatam, twice; 9, Jubbulpore; 10, Hussungabad; 11, Kamptee, three times; 12, Jaulnah; and 13, Nassick. Nos. 1, 2, 5, and 12, were generally healthy when he was there. No. 3 has, as a rule, been found unhealthy for European troops; whether from the locality of the old barracks or not, he cannot say. He commanded the 3rd European regiment in these barracks for 23 months, and during that period they were very healthy. He was at No. 4 on its formation, when the corps he belonged to was entirely knocked up with fever: he believes it is healthy now. No. 5 is well known. Nos. 6 and 7 are very hot, and subject to periodical attacks of cholera, otherwise healthy. No. 8, pretty healthy, but subject to periodical attacks of sickness. Nos. 9 and 10, feverish. No. 11, 25 years ago, was subject to a very fatal inflammatory description of fever, but is now much improved. Nos. 12 and 13 were very healthy; some years ago, however, the former was subjected to a most deadly attack of cholera.
III. SANITARY CONDITION OF STATION.	1, 2, 3, 4. A general map of the station and surrounding country, plans of the barracks, &c., together with particulars of barrack accommodation will be forwarded. 5. The windows of the barrack-rooms are on both sides, and open down the centre longitudinally. There are verandahs on both sides of the old barracks, 8 ft. 5 in., and on the outside of the new barracks 7 ft. 6 in. broad, except to the east of the new range. The inner verandahs in the new portion of the barracks are occupied as sleeping quarters by 103 men. Some of the windows and doors are glass and panelled, some with glass windows and shutters, and some Venetianed. 6. The bedsteads consist merely of boards and trestles. The bedding consists of a mattress, blanket, and cover, with pillow. The bedsteads are infested with bugs, and Dr. Murray would strongly recommend that iron ones, as in use at home and elsewhere, be substituted. 7. The dimensions of a tent are as follows:—20 ft. long, 14 ft. broad, and 5 ft. 4 in. high. The sloping roof is 20 ft. long, 14 ft. broad, and 5 ft. 2 in. high. The cubic area is 2,216 ft., and the superficial area 280 square feet. These tents are supposed to accommodate 25 on ordinary marches and 20 men on field service; thus giving only from 88 to 110 cubic feet of air per man. 8. Ventilation in barracks is effected by means of doors, windows, and pent-houses in the roofs, and also by ventilators in the walls, regularly arranged along their tops. The guard-rooms are ventilated by doors and windows only. Dr. Murray states the means of ventilation in the barrack rooms do not keep the air pure by night, the windows and doors being necessarily to a great extent shut. There are no means used for cooling the barrack rooms. Punkahs are not used or required in barracks at this station; they have them in the hospitals, but the men don't like them. 9. The barracks are built of laterite stone, plastered. The roofs have teak wood rafters, reapers, and are double-tiled. The tents are constructed of a coarse punjum cotton cloth, made for the purpose—two white, and one blue. There are no huts. 10. The floors are composed of laterite stone, raised from the ground about 4 feet. There is no passage of air beneath. 11. The materials used in the construction of the barracks, &c., are suitable to the climate. They are kept in repair by the department of public works, on the application of the commanding officer of the regiment, through the brigade major. The repairs are not generally quickly executed. The brigadier commanding is answerable for the sanitary state of the cantonment on the reports of the several medical officers. The walls and ceilings of barracks are limewashed once a year: the orders are for their being kept constantly well swept and clean. 12. There are six lavatories attached to the barracks, supplied with water by puckallies. The water runs off into the barrack drains. 13. Sketch and description of barrack cook-houses will be sent. The native dhobies or washermen take the clothes away, and wash them at any stream, and dry them on ropes on the parade, generally. 14. A sketch and description of the privies and urinals will be sent. 15. The privies have chimney ventilators leading from where the tubs are placed, to the outside. They are lighted from the doorways by day, and by tin lamps at night. The barracks are lighted with oil in glass burners, suspended in globe and square glass lamps. 16. The drains from the barracks run on all sides of the buildings, and are generally open—about 1 ft. deep and 1 ft. broad. Here and there they are paved with granite, but are generally constructed of laterite stone, which is very unsuitable, being so porous. The sewers from the privies, as well as from the barracks, lead into covered drains outside the barracks, the outlet of which is into the sea, about 60 yards off. The drainage is insufficient, there not being enough slope to carry it away readily. During the wet season the barracks, cells, and hospitals are all damp in the floors, in consequence of the porous nature of the materials of which they are made. Dr. Murray would recommend wooden flooring instead. The fluid refuse drains off as above described; but the drains are generally badly constructed. There are no cesspits or foul ditches. 17. The cantonment and its vicinity are generally very clean. Scavengers' carts are used to take away the refuse and manure from the different bazaars, which are taken some distance away, and deposited in pits dug for the purpose. 18. Every means available are taken to keep the cantonment clean of all objectionable vegetation and deleterious herbs likely to cause malaria. The back of the bazaar, and for a great distance outside the cantonment, is intersected in every direction with high mud walls, with pathways between. This is the style of division of property in Malabar, and can not be altered, without infringing on the habits of the population, and on private rights. The hospital of the 66th has a high wall on three sides, which interferes with the ventilation; but it has been recommended to be reduced in height, with a railing instead. The sanitary condition of the cantonment bazaar is good and clean. The drainage is very good, and water is abundant. The bazaar is not overcrowded. Some arrangement is required for the erection of public privies and

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	latrines for those who are unable to have private privies. All who have not, ease themselves in open spots outside the cantonment, to the injury of the public health, as well as decency. The arrangement of these matters is at present in a transition state. Formerly, there being no municipal fund, such was done out of the fine fund levied by the superintendent of police. This has lately been forbid, and estimates have been ordered to be sent in for the necessary expenses, but such not having been sanctioned, and probably may not be for a long time, there are at present no funds available for this, and the commanding officer does the best he can. Since this was written, adequate funds have been authorized for the conservancy of the cantonment. The native houses are good; some are tiled, and others thatched with the cocoa-nut leaf. There are dung-heaps and cesspits within the compounds. Moreover, the Tiers without the cantonment bury their dead within their own compound; those within the limits of the cantonment are not permitted to do so. There is no nuisance experienced in barracks from wind blowing over the native dwellings. 20. Dr. Stevens states, the place where animals are slaughtered for the soldiers is just within the limits of the cantonment north of the fort. The offal is thrown into a small back water close by, and is a nuisance to the surrounding houses. Brigadier FitzGerald states he does not know of any more suitable place. It is as far removed as possible from all the barracks and officers' lines. The wind seldom blows from that quarter; and the back water is open to the tide. 21. There are very few horses in the bazaar. Where there are, they are kept in the owners' stables. No inconvenience is experienced. 22. There are no artillery or cavalry stables, or picketing grounds for horses, at this station. 23. No married people occupy barrack rooms with the men. Married men are accommodated with quarters out of barracks, in what is now a village occupied by Christians, half-castes, &c.; this spot was originally the regimental patchery. Separate ranges of married men's quarters are very desirable.
Officers' Quarters.	1. The condition of the officers' quarters is good. Those of the European regiment are situated on a line facing the sea, the houses on each side of the main road. Four or five of these houses are so situated as to be under the immediate influence of the exhalation from the Roman Catholic burial ground, and which is very prejudicial to that neighbourhood. It is in the midst of a densely populated place, called Barnacherry, which is principally inhabited by the families of the European regiment, half-castes, and natives, and a large bazaar. It is strongly recommended that it should be shut up, and no interments permitted to take place. There is a large open drain running through Barnacherry, and throughout the premises belonging to the German Mission, close to the burial ground, taking its course to the sea; this should be arched over.
IV. Health of the Troops.	1. The station is generally healthy; but the town of Cannanore at certain periods of the year is very unhealthy. 2. The prevailing diseases among the native population are cholera, small-pox, dysentery, and diarrhœa. 3. Dr. Stevens attributes the unhealthiness of the town of Cannanore to its being overcrowded, and from the people of the Tier caste burying their dead within their own compounds; also to the numerous places of interment in the midst of the town belonging to the Moptah inhabitants. 4. The last station of Her Majesty's 66th Regiment was England, where it was for 14 months, and left 29th August 1857. The state of health there was good, the principal diseases being venereal. They arrived at this station on 13th December 1857, in good health. The regiment has since suffered principally from fevers, venereal, and bowel complaints; pulmonic, rheumatic, and hepatic diseases. No part of the men's present accommodation is more unhealthy than the rest. 5. The troops are not regularly camped out every year; but portions of the regiment have at different times been encamped for sanitary reasons, with the best results. 6 to 16. No experience of hill stations. 17. There is no higher ground near the station, which could be advantageously occupied as a hill station. 18. Gravelly soil is the most healthy for stations, and black cotton soil and deep clay the most unhealthy. 19. Dr. Murray considers that no soldier should leave England for India until he has served at home for at least three years, or until he be 25 years of age, and has a constitution to some extent established and strengthened. The best period for troops to land in India is at the commencement of the cold weather. Recruits on landing in India should be carefully kept from exposure to the sun. The drills and duties should be as light as possible, consistent with a due regard to the maintenance of discipline. Every facility should be afforded for their amusement and recreation, without exposure; but the utmost attention should be paid to the wholesomeness and proper cooking of their rations, to their personal cleanliness, and a proper supply of wholesome water. If possible, they should be sent to a cool and undoubtedly healthy station, until they have to some extent become habituated to the climate. 20. Dr. Murray believes that if the constitution of the recruit is established, and he shows no symptoms or tendency to disease, he may be sent direct to India without disadvantage. 21, 22, 23. No reply to these queries. 24. Dr. Murray considers that pulmonary and rheumatic cases should leave India for England in or about the month of February, so as to arrive in England in May or June. Invalids labouring under other diseases may leave at any season, as they are likely to derive great advantage from the sea voyage previously to landing in England.
Diseases.	1. There are regular inspection parades once a week in Her Majesty's 66th for the discovery of diseases. 2. There has been no scorbutus or scorbutic disease in Her Majesty's 66th Regiment since their arrival in India, with the exception of two cases of chronic dysentery, which

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	presented scorbutic symptoms before death; both these cases, however, came into head-quarters from detachments. 3. The proportion of hepatic to other diseases usually under treatment is 4 per cent. The disease is attributable to climate, and has not occurred generally as the consequence of other diseases; it has sometimes been observed in connexion with or as the consequence of dysentery. Avoidance of exposure to the sun, and protecting the body by wearing flannel or woollen under-clothing, I consider the means most likely to diminish the frequency of this disease, combined with habits of temperance and general regularity. 4. No case of dracunculus has occurred in the 66th Regiment. 5. The proportion of the constantly sick from venereal to the total sick from all other diseases, is 33 per cent. The precautions I would suggest for diminishing the sick from these complaints are, the establishment and maintenance of a lock hospital, and the punishment of all prostitutes who are known to have communicated the disease, as well as the regular inspection of all native men in the Government pay. 6. The forms of fever prevailing at this station are the continued and badly-marked remittent types, Intermittent fever also occasionally occurs, but rarely. The forms are all of the asthenic type, and frequently complicated with internal inflammation and congestions, particularly of the lungs and bowels. Dysentery is common during the south-west monsoon, and is generally of a subacute nature. Cholera does not prevail. Small-pox. No case of this disease has occurred in Her Maiesty 66th Regiment at this station. Rheumatism is common during the south-west monsoon, and is generally of a very intractable and obstinate description. The proportion which admissions and deaths from these diseases bear to the total admissions and deaths is as follows:—

Diseases.	Proportion of Admissions.	Proportion of Deaths.
Fevers { Febris Intermit.	0·015	—
Fevers { „ Remit.	0·001	—
Fevers { „ C.C.	0·093	—
Cholera	0·002	0·100
Dysentery	0·078	0·200
Small-pox	—	—
Rheumatism	0·049	—

7. The more frequent zymotic diseases at this station in Her Majesty's 66th Regiment are fevers and dysentery, but neither prevail to a great extent, and they are like diseases generally on the coast, of the asthenic type usually; they are most prevalent from April to November, during the south-west monsoon or wet season. They do not prevail particularly in any locality. The sanitary condition of the bazaar, &c., is good; no habits or conditions among the men of Her Majesty's 66th, or otherwise within the limits of the cantonment, appear to predispose to these diseases.
8. No epidemic disease has occurred in the 66th Regiment at this station.
9. Quinine has not been given as a prophylactic at this station; it has been so given to small detachments of the regiment marching to and from the head-quarters, with good result.
10. No reply to this query.

V. INTEMPERANCE.

1. The soldiers at this station, as a body, are very temperate.
2. The number of admissions into hospital of Her Majesty's 66th Regiment in any way attributable to intemperance is exceedingly small. During the year 1859, out of 1,037 admissions, only 4 can be in any way placed under this head, giving only a proportion of 0·38 per cent. of admissions. Drunkenness is always punished as an offence.
3. Arrack supplied by the commissariat is sold in the regimental canteen to the men. Each man may have 2 drams or $1\frac{1}{2}$ gill daily, but not more, and on the whole not more than half of this amount is consumed daily by the men. No liquor of any description is allowed to be sold in the bazaar to European soldiers. Spirit is not supplied as a ration. It is not a habit with the men to take a dram before morning parade. It is not given as a ration to convalescents. Ginger beer and coffee, as well as porter and ale, are also sold in the canteen.
4. The consumption daily of the amount of arrack allowed is by no means injurious to the health of the men. Brigadier FitzGerald considers the quantity of spirits allowed the men is conducive to their general efficiency.
5. Dr. Murray considers that it would be injurious to the health of the men to stop their allowance of spirit, as he believes they would find means to provide themselves with an inferior description of intoxicating drink.
6. Dr. Murray is of opinion that good malt liquor or good wine, in moderate quantity, is decidedly preferable, in a sanitary point of view, to spirituous liquors; but he does not consider that a small quantity of good spirit is objectionable.
7. Coffee and ginger beer are used to some extent, but malt is the favourite drink among the men. Spirits and malt liquor are both used in such a moderate quantity that no satisfactory comparison can be drawn; they are all good in moderation.
8. There is no ration of spirit, and the men drink beer in preference.
9, 10. Dr. Murray thinks it would be injurious to suppress altogether the sale of spirit; he considers the limitation at present existing in regimental canteen very satisfactory. No recommendations to suggest.
11. Canteen and bazaar regulations annexed. The following are the most important provisions as regards health:—

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	The canteen is open at the following hours for the issue of the following quantities of liquor :— 12 to 1 p.m. - - - - - 1 pint of beer. 2 p.m. to ¼ past 3 p.m. - - 1 dram of arrack, or 1 pint of beer. 6 p.m. to ¼ to 8 p.m. - - - for the same allowance. No man is to receive more than 1 glass of arrack or 1 pint of porter at any one issue, nor can more than three issues be made to any one soldier during the day. No defaulter can enter the canteen on any pretence. In the bazaar no spirituous liquor or intoxicating drug is allowed to be sold to any European soldier without a written licence from the commanding officer, under a penalty not exceeding 50 rupees. Any camp follower, or military pensioner, or soldier's wife, having in their possession spirits without a permit, is liable to a fine of 50 rupees. Natives smuggling spirits or intoxicating drugs within the limits of the cantonment, and selling the same to an European, are liable to imprisonment for one month, or, on the second offence, to corporal punishment, not exceeding 50 lashes.
VI. Diet.	1. The ration for the troops is as follows :—1 lb. bread, first sort; meat, 1 lb., beef five days and mutton two days in the week; ⅝ oz. tea, or 1⅞ oz. per day of coffee; 2½ oz. of brown sugar, second sort; 4 oz. of rice, first sort; 1 oz. of salt; 12 oz. of potatoes, 2 oz. of onions, and 2 oz. of country vegetables, according to the season. The inspection usual in Her Majesty's service is daily made of all rations and provisions supplied for the use of the troops. 2. No fruit is included in the ration, nor is such procurable if it were. The pay of the soldier in India is calculated exclusive of rations. The soldier partakes of three meals a day, viz., breakfast at 8, dinner at 1, and evening meal at 4. The breakfast consists of bread and about 1 pints of tea or coffee, with a portion of the meat supplied for dinner. The dinner consists of 16 oz. of vegetables and 4 oz. of rice, with beef or mutton, minus the portion prepared for breakfast, and cooked according to the liking of each individual soldier. The evening meal consists of bread and about 1½ pints of tea or coffee. All the meals are considered ample and good. 3. Dr. Murray thinks that a ration of the best fish might with advantage be given to the men twice or three times a week, excepting during the very hot months, February, March, April, and May, when the fish are soft and not in condition. Brigadier FitzGerald thinks that once a week would be sufficient; only a portion of the regiment could be supplied in one day. He is not aware of any attempt to dispose of the rations. 4. All necessary apparatus, boilers, frying-pans, &c., are kept up by the Commissariat on indent as required. The kitchens are clean and well ventilated, and sufficiently supplied with water. The cooking is properly done and sufficiently varied. Tea and coffee are also supplied. Before a march the men always have coffee, or ginger tea and biscuit, and also when the march is half over. 5. Gardens for the cultivation of vegetables by soldiers would be very desirable when ground with a sufficient supply of water is available close to the barracks. A few already exist. Brigadier FitzGerald considers that when practicable, as above, Government ought to enclose the ground, dig wells, make water-courses, and provide apparatus for raising the water; also erect quarters for the man in charge of the gardens, who receives and takes charge of the tools each day, locking them in a place to be provided for the purpose. All garden tools and implements to be provided by Government, and reported on like any other article of barrack furniture. It would also be desirable that Government should, as far as possible, assist with a few suitable seeds. The garden ground is divided off into lots and numbered. All men wishing to have gardens intimate the same to a committee composed of non-commissioned officers, paying a subscription of 4 or 6 annas a month, according to circumstances. This subscription goes to pay for raising water and the hire of a few coolies for gravel-work, keeping the roads and pathways clean. They are not to be allowed to work in men's gardens. The accounts are kept by one of the committee appointed by the commanding officer; and an officer selected by him also acts as treasurer, and exercises a general superintendence. The above rules worked well in practice in the 3rd Madras European regiment at Secunderabad, when under Brigadier FitzGerald's command.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of a scarlet cloth tunic, cloth trousers, and a pair of boots, issued biennially, with a wicker helmet. In the alternate years a red serge tunic, cloth trousers, and a pair of boots, are supplied. For the summer or hot season, two suits of khakee clothing, made of cotton material, are supplied, worn generally with a foraging cap covered with khakee, and reckoned part of his regimental necessaries. A great coat is allowed to each soldier every six years. The accoutrements consist of a pouch belt, with moveable buff cap pocket attached, a waist belt, with a moveable frog for the bayonet, a waist plate, and bayonet scabbard, and two pouches to contain respectively 40 and 20 rounds of ammunition; the former (40-round pouch) attached to the pouch belt, but moveable, and hangs behind; and the latter (20-round pouch) attached to the waist belt, also moveable, and hangs on the right side of the soldier in front. The present dresses in use are suitable to the variations in the climate. Dr. Murray thinks that in the wet season the men should all be provided with woollen socks. Brigadier FitzGerald states that no European sentry is exposed to sun or wet when on guard. The dress is according to the season.
Duties.	1. Dr. Murray thinks it would be highly desirable that men should be thoroughly drilled at home before being sent to India. 2. The men of the 66th Regiment do not suffer in health from drill. During the cold season the men are out at exercise once a day for not more than an hour for five days in the week, either morning or evening, as may be found most suitable. Now and then on an emergency they may be out morning and evening; and this is independent of inspections of kit, &c., in barracks. In the hot months they are not out more

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References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*Duties—cont.*	than twice a week, and in the monsoon probably for weeks not at all. The best hours for drills, parades, and marches, speaking generally, are early in the morning, or late in the afternoon. In the monsoon, or wet season, however, Dr. Murray thinks the men should not leave their barrack rooms before day-break. There are general orders extant as to the hours for and direction of drill. The men have at present seven nights in bed. 3. Guards are mounted within a short distance of the barracks. The men are 24 hours on guard. Night guards are not heavy, and have not acted prejudicially on health.
III. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation:—There is one ball court, one skittle ground, a school, and a cantonment library; but there is no reading room for the men, or day room, nor any soldiers' clubs. There are a few soldiers' gardens, but no workshops. A very large and most creditable building has been erected by Her Majesty's 66th Regiment as a theatre. There is no gymnasium. The means of recreation, &c., are not at all sufficient to keep the men occupied during the heat of the day, and during the wet season; indeed, during these times the men have no occupation whatever. The men are not allowed to expose themselves to the sun between 8 a.m. and 4 p.m., and with the best results to health. 2. Dr. Murray would recommend that skittle grounds, workshops, and gymnasia, should be erected, in which the men might find occupation and amusement, protected from sun and rain. Brigadier FitzGerald is certain that any extra expense incurred would be more than repaid by the health of the men, and many such might be made self-supporting. 3. A regimental savings' bank is in operation, and is highly advantageous. 4. The only shade the men have during the day are the verandahs.
IX. MILITARY PRISONS.	1. There are no military prisons, and the cells are unsuitable for the confinement of prisoners for any lengthened period, being built on the level of the ground, and excessively damp during the wet season. They have not sufficient cubic space, being only about 750 cubic feet, and they have no means of communication between the prisoner and the provost serjeant.
X. FIELD SERVICE. XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under these heads.
XII. HOSPITALS.	1. The ground plan and sketch of the elevation of the hospital will be forwarded. 2. The hospital of the 66th Regiment is situated on the cliff, about half a mile north of the barracks. It is remote from the bazaar, and but few native houses are in its vicinity. With the exception of a high wall, which surrounds it on three sides, the site is a most excellent one, and freely exposed and ventilated. It is quite open on the seaward side. It is healthy, and free from all nuisances. 3. The water supply is abundant and wholesome. 4. There is a system of surface drainage for removing all water and other impurities, and the rain water. It escapes over the cliff about 110 yards from the hospital. 5. The lowest wards are raised above the ground only by about 1½ ft., and the highest about 4 ft. There is no perflation of air under the floors. The rain water from the roof partly sinks into the subsoil, but is principally carried away by the surface drains. These drains are connected with the kitchen and all the bath-rooms, and carry away the rain-fall readily over the cliff into the sea. The hospital walls are built of laterite stone, and the roofs are tiled. Both roofs and walls are single; but there is free ventilation by windows, doors, and openings at the top of the walls, and between them and the roof. The hospital is supplied with verandahs on all sides, about 13 ft. wide, which afford good shelter from the sun's rays. There is one small inner verandah attached to the main building of the hospital, which is used for the accommodation of men temporarily detained at the hospital; it accommodates about six beds. All the buildings consist of one flat.

TABLE of Hospital Accommodation.

Total number of wards, 14.

Total regulation number of beds, 104.

Wards or Hospital Huts. No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		Ft. In.	Ft. In.	Ft. In.	Feet.			Ft. In.		Ft. In.	Ft. In.
No. 1 Block.											
Front Ward	10	34 0	20 0	16 6	11,220	1,122	68	1 6	6	5 6	5 6
Centre Ward	18	57 6	20 0	16 6	18,975	1,054	65	,,	10	6 6	5 1
Do. Right Wing	7	26 0	20 0	16 6	8,580	1,226	74	,,	3	6 6	5 1
Do. Left Wing	7	26 0	20 0	16 6	8,580	1,226	74	,,	3	6 6	5 1
Rear Ward	10	34 0	20 0	16 6	11,220	1,122	68	,,	6	5 6	5 6
Outside Verandah	—	—	13 10	8 3	—	—	—		—	—	—
Inner ditto	—	37 3	12 0	8 3	3,687	—	—		4	4 6	3 9
No. 1 Bath Room	—	12 0	5 0	8 3	891	—	—		1	3 6	3 0
No. 2 ditto	—	12 4	6 10	8 3	610	—	—		1	4 2	3 10
No. 2 Block.											
1 Ward	32	98 2	20 0	16 0	31,616	988	62	1 6	12	6 0	5 0
No. 1 Bath Room	—	10 5	9 0	9 0	843	—	—		1	3 5	3 5
No. 2 ditto	—	10 5	10 5	9 0	976	—	—		1	3 5	3 5
Privy	—	10 8	10 8	6 11	787	—	—		1	3 5	3 5

Wards or Hospital Huts. No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
No. 3 Block.		Ft. In.	Ft. In.	Ft. In.	Feet.			Ft. In.		Ft. In.	Ft. In.
1 Writer's Room	—	24 0	10 0	16 0	3,840	—	—		3	6 0	5 0
1 Store Room	—	30 0	10 0	16 0	4,800	—	—		2	6 0	5 0
1 Surgery	—	30 0	12 0	16 0	5,760	—	—		2	6 0	5 0
1 Room } or Nurse's {	—	18 0	10 0	16 0	2,880	—	—		1	6 0	5 0
1 Ditto } Quarters {	—	19 9	12 0	16 0	3,792	—	—		1	6 0	5 0
1 Female Ward, No. 1	6	43 0	10 0	16 0	6,880	1,166	72	1 6	2	5 6	4 6
1 Ditto, No. 2	6	41 0	12 0	16 0	7,872	1,312	82	„	2	5 6	4 6
Verandah	—	—	11 9	9 0	—	—	—		—	—	—
Bath Room, No. 1	—	10 0	8 0	16 0	1,280	—	—		1	4 0	3 0
Ditto, No. 2	—	23 6	8 0	16 0	3,008	—	—		3	4 0	3 0
Privy	—	10 0	10 0	7 0	700	—	—		1	4 0	3 0
No. 4 Block.											
Ward, No. 1	4	19 9	15 10	14 0	4,377	1,094	77	1 6	1	4 7	4 7
Ditto, No. 2	4	19 9	15 10	14 0	4,377	1,094	77	„	1	4 7	4 7
Ditto, No. 3	4	19 9	15 10	14 0	4,377	1,094	77	„	1	4 7	4 7
Ditto, No. 4	2	19 9	9 10	14 0	2,718	1,359	97	„	1	4 7	4 7
Ditto, No. 5	2	19 9	9 10	14 0	2,718	1,359	97	„	1	4 7	4 7
Ditto, No. 6	2	19 9	9 10	14 0	2,718	1,359	97	„	1	4 7	4 7
Verandah	—	—	10 2	8 6	—	—	—		—	—	—
Privy	—	11 6	10 0	11 4	1,322	—	—		1	4 3	4 0
Out-houses connected with the Hospital.											
1 Room } or Serjeant's {	—	15 0	15 0	14 0	3,150	—	—		2	5 0	4 6
1 Ditto } Quarters {	—	15 0	10 0	14 0	2,100	—	—		2	5 0	4 6
Cook Room	—	22 10	22 8	14 0	7,245	—	—		2	5 0	5 0
1 Store Room, No. 1	—	14 0	7 4	12 0	1,232	—	—		2	5 0	5 0
1 Ditto, No. 2	—	14 1	14 0	12 0	2,366	—	—		1	5 0	5 0
1 Ditto, No. 3	—	14 1	14 0	12 0	2,366	—	—		1	5 0	5 0
1 Large Store Room	—	22 0	22 0	14 0	6,776	—	—		2	5 0	5 0
1 Privy	—	14 0	10 2	12 0	1,708	—	—		1	5 0	5 0
1 Dead-house	—	20 0	15 0	10 8	3,200	—	—		4	6 0	5 0
Convalescent Shed	—	40 0	20 0	5 9	4,600	—	—		—	—	—
Guard Room	—	17 11	11 11	14 0	2,988	—	—		2	5 0	5 0

References to Subjects and Queries.	Replies.

The hospital is in the best situation possible, and receives the full benefit of the winds, but for its wall, which, however is, as Dr. Murray understands, going to be done away with, and a rail substituted. The windows open down the centre from top to bottom; they are principally glazed, but some are jalousied, and some are partly wooden; a few open transversely.

6. The only means of ventilation are the doors, windows, and openings at the top of the walls. There is always sufficient breeze to effect a thorough ventilation, except sometimes of a night. There are a few jalousies constructed in the ordinary way.
7. There are no artificial means for cooling the air, except by ordinary punkahs, which are unnecessary in general, and are not liked by the men.
8. There are no means of warming, nor are any required. Hitherto the walls have been limewashed once a year: the floors and lower part of the walls, &c., are frequently limewashed.
9. The privies and urinals of the hospital are situated at a distance apart from the wards, with which they are all connected by covered ways; they consist of roomy apartments, built of the same material as the hospital. There is no drainage for the privies, large tubs are used under the seats for the accommodation of the men, and the soil is always removed at night. Charcoal is used to deodorize them.
10. There is a bath-room attached to each ward, provided with tubs for lavatory purposes, and plentifully supplied with water.
11. The sick have no means of bathing except in tubs in the different bath-rooms.
12. The hospital linen is washed and dried, &c., at a distance from the hospital by a native contractor.
13. The storage is sufficient, but is of course in the wet season not exempt from the general dampness of the coast.
14. The bedsteads used in the hospital are of wood with tape bottoms; and the bedding consists of blankets, sheets, and pillows. There are no mattresses, but a kind of palliasse is used instead. The supply of bedding is ample. Dr. Murray would suggest the adoption of iron bedsteads, as in use at home, in preference to the wooden ones in use here.
15. The hospital kitchen is a separate building, distinct from the other buildings, with which however it is connected by a covered way; the means for cooking are ample, and the cooking vessels are fresh tinned inside once a fortnight. There are means for cooking food in every variety as may be ordered.
16. Diet tables, &c., are forwarded.
17. The sick are attended by coolies and other native servants, and there is also an hospital serjeant, and a nurse for attending sick women and children: there are no regimental hospital orderlies allowed by the regulations of the presidency, but when any patient is very ill, he has the attendance of an orderly man from his company, or if necessary of two orderlies, one to relieve the other.
18. The sanitary condition of the hospital is in every respect satisfactory. No epidemic disease, hospital gangrene, or pyæmia, have appeared during its occupation by the 66th Regiment.

CANNANORE.
MADRAS.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	19. No answer to this query. 20. There are no trees or shaded walks within the hospital enclosure, but there is a large compound in which convalescents may take exercise in the cool of the evening; there is also an hospital cart, in which convalescents are sent out in the evening to the north beach or elsewhere for change; and there is also a dooly available for this purpose. 21. The women and children of the regiment when sick are admitted into the female ward of the hospital, and dieted and treated on the same principle as the men. There is no hospital stoppage for children, and only 1½*d.* a day for women. All the hospital arrangements are quite satisfactory. 22. There are no special hospital regulations not included in the general presidency medical regulations. 23. The powers of the medical officer in matters of diet and medical comforts are absolute. In matters of repairs, &c., his recommendations to the officer commanding the regiment are always considered and attended to. 24. There is a ward in the hospital which is specially set apart for the accommodation of convalescents and of invalids who may have been long under treatment and are awaiting a passage to England. They are not on hospital diet, but are otherwise subject to the hospital regulations, and are constantly under the observation of the medical officers.
XIII. BURIAL OF THE DEAD.	1. The Protestant burial ground in use is in the cantonment; it is the property of Government, and is 900 yards from the barracks. There is another spot enclosed for a new one, but never used, and is 620 yards from the barracks. The Roman Catholic burial ground, the property of the Roman Catholic clergy, is about 400 yards from the barracks, and is very objectionably situated. 2. The old Protestant burial ground contains 8,838, and the new 14,500 superficial square yards; and the Roman Catholic 6,833 square yards. The subsoil in both is gravel, and they are well kept. 3. The space allowed for graves is about 6 or 7 feet long, by 2 broad, and the interval between each grave from 1½ to 2 feet. Six feet is the depth according to orders in the Protestant ground. There is only one instance on record of a grave being re-opened for the interment of a relative. In the Roman Catholic burial ground it is known that graves have been constantly re-opened and the bones removed, but such has been put a stop to. The rule in all cases is, if death takes place during the night or early in the day, interment takes place in the evening, otherwise next morning before 7 a.m. As regards the native troops, the period between death and interment or cremation is even less than the above. No compulsory order is required. 4. The graveyard used by Roman Catholics is situated in the centre of the lines, and is very offensive, being altogether too full and crowded. Dr. Murray considers that further burial in this place ought to be stopped. Brigadier FitzGerald has had a board to report upon this burial ground, with a view to the nuisance being put a stop to if possible. There is still ample space, and until the locality can be changed, means have been adopted to ensure the graves being of a proper depth. It has never appeared that there has been any complaint as regards the Protestant burial ground. 5. The dead of camp followers or bazaar people are buried or burnt at various spots outside the cantonment at a distance of from one to two miles from the European barracks, and something less from the officers' lines and native lines generally. 6. No perceptible injury accrues to the public health from the present practice, except in the case of the Roman Catholic burial ground, already remarked upon. 7. Brigadier FitzGerald has recommended a new site for both the Protestant and Roman Catholic burial grounds in what appears to him the very best, if not the only, locality in or near the cantonment. The spot alluded to is within the limits of the cantonment.

(Signed) JAS. FITZGERALD, Brigadier,
Commanding Malabar and Canara.
JOHN LOVELL, Deputy Inspector-General of
Hospitals, Malabar and Canara.

9th November 1860.

BELLARY.

Accommodation { Queen's Troops { Artillery - - 242; Infantry - - 796 } ; Native Troops - { Cavalry - - 394; Infantry - - 1,830 } } Total - - 3,242.

References to Subjects and Queries.	Replies.
I. TOPOGRAPHY.	1. The surrounding country is a gently undulating plain with detached granite rocks. It is in general very flat, dry, and arid. There is no wood or jungle, and water is exceedingly scarce. 2. The elevation of the station above the sea is by the most recent levels 1,500 feet, but these require to be checked. General Cullen's barometrical observations make the elevation 1,600 feet above the sea level. The adjacent country within 4 miles from N.E. to S.E. by the west is elevated about 50 to 70 feet above the station. From S.E. to N.E. the country falls rapidly into the valley of the Hugry. 3. The nearest lake is the Darojee tank, distant 18 miles, about 20 feet higher than the station. The Hugry river passes within 10 miles of the station and is 112 feet below it. It is usually dry. 4. There is no higher or healthier ground adjoining the station. No table land, but within 6 miles of the station there is a range of small hills, and among these there is a peak which rises to about 1,000 feet above the station.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	The vicinity is not liable to overflow of water. There are a few ravines, which serve to carry off the rain. They are not prejudicial to health. 5. The station is perfectly open, and quite free from all obstacles to a complete circulation of air on every side. A few houses near the granite hills referred to suffer from reflected heat, but the station does not. The station is exposed to cold dry easterly or north-easterly winds in November, December, and January; in some years giving rise to intermittents, pulmonic affections, and bowel complaints. It is also exposed to dry warm land winds from February to June, not prejudicial to health. The rest of the year, a pleasant strong westerly wind prevails, but if there is failure of rain, it becomes rather unhealthy. Ophthalmia and rheumatic affections prevail. 6. The surrounding country is generally cultivated according to season. There is no artificial irrigation. There is no rice cultivation near the station, nor of indigo, neither is the preparation of flax or hemp carried on anywhere near it. 7. A large native town adjoins the station. 8. The general surface is black cotton soil, but near the granite hills a stony, red, gravelly soil is met with. The subsoil is calcareous nodules. The ground at present occupied by the station is entirely new. 9. During dry seasons water is hardly to be obtained at any depth. In a good rainy season water rises to within 4 or 5 yards of the surface. 10. The rainfall is absorbed by the soil, and passes readily into the numerous wells of the station. No rainfall lies on the surface. No drainage from any higher level passes into the subsoil of the station. 11. The water supply of the station is derived principally from wells. There are only two tanks in which water is stored, supplied from rainfall. One tank usually has water all the year round, the other has been dry about seven months. They contain neither plants nor animals. Natives are prohibited from bathing in one tank, but that they do so there is very little doubt. The wells used for drinking purposes receive no foul drainage, or leaves or other matter. There is no malaria near the station. The tank on the south side of the fort from being so shallow is liable to dry up, and during that process emits an unpleasant smell. Means can be provided for keeping the tank full. 12. The water is so scattered over the station that it would be difficult to estimate the available quantity. That used for drinking purposes is good as to colour, taste, and smell. Well No. 1, clear, pleasant taste, no salts, has animalcules. Well No. 2, clear, pleasant taste, no salts, has animalcules. Well No. 3, pleasant taste, no salts nor animalcules, but a considerable quantity of decayed vegetable matter. The water is at present raised for use by leathern bags, drawn up by bullocks, and emptied into cisterns and channels built for the purpose. There is reason to believe that a never failing supply of water might be brought in from the Issugabudra, the channel from which must be 50 or 60 miles in length. This would be expensive, but any expense is better than the present uncertain supply of water, which depends entirely on the rain of the season, which sometimes fails, as it did in a great measure last year. 13. Plantations and avenues of trees would add to the agreeableness and health of the station. 14. The topographical and sanitary examination of sites is made generally by a mixed committee of military and medical officers.
II.—Climate.	1. The meteorological instruments supplied by Government have always been imperfect or unserviceable. No proper agency for registering observations, consequently those in the following Table are only approximately correct:—

1851 to 1859.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, inches.*	Winds.		Days of Sunshine.	Remarks as to Clouds, Dew, Winds, Storms, &c.
										Direction.	Force.		
		°	°	°	°	°	°	°					
January -	28·648	74	10	78	68	78	64	102	0·15	E. & N.E.	Moderate	—	Clear sky with cumuli throughout the cold and hot seasons. Cloudy during the S.W. monsoon. Dew scanty and partial. Westerly winds, strong. Storms very rare. Occur once in several years.
February -	28·642	79	16	81	65	80	68	104	0·02	Do.	Do.	—	
March -	28·589	85	16	85	68	90	70	105	1·03	W. & N.W.	Do.	—	
April - -	28·584	88	13	90	75	84	75	107	1·04	W. & S.W.	Do.	—	
May - -	28·585	86	15	92	77	82	70	106	2·06	Do.	Do.	—	
June - -	28·507	83	12	86	76	85	75	99	1·81	Do.	Do.	—	
July - -	28·400	80	8	82	72	79	73	97	1·70	Do.	High	—	
August -	28·459	79	10	82	73	81	72	97	3·02	Do.	Do.	—	
September -	28·470	79	10	84	73	82	68	94	3·75	Do.	Calm	—	
October -	28·450	78	9	80	70	79	72	91	5·61	Do.	Do.	—	
November -	28·680	74	8	80	72	73	69	89	1·09	E. & N.E.	Moderate	—	
December -	28·700	73	10	79	68	72	65	88	0·39	Do.	Do.	—	

* Rainfall on a 19 years' average.

3. The climate is dry and temperature not very high; not being humid the heat is bearable, range not great. No fogs. Dust storms occasionally occur, but the air is usually clear and elastic.

The climate is favourable to the health of troops. During the hot season a diet of less animal food and stimulating drinks desirable. Barrack accommodation and dress now so good as not to need change. The sun is powerful in October and November, and late morning drill or early evening drill should be suspended. From March to July there should be no evening drill, &c. Some years will pass without any particular month or months being unhealthy, but fever—intermittents, and occasionally remittents, and bowel complaints, may be looked for from October till January. In the hot months ephemeral or continued fever of short duration. The rainy season healthy.

BELLARY. MADRAS.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	4. There is no district near the station the climate of which would be more conducive to health. 5. As regards the comparative healthiness of different stations at which the medical officer has served, the following is the result of Superintending Surgeon Eyre's experience in a professional career of near 32 years:— Belgaum 1830.—European troops there suffered severely from dysentery, both officers and men. Secunderabad 1832-3-1842.—European epidemic dysentery prevailed, but except from this disease it is in other respects a healthy station. Jaulnah.—Remarkably healthy. Nagpore.—Very healthy. Bellary.—The healthiest of all.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Maps and plans attached. 4. *Table of Barrack Accommodation.* Date of construction—commenced 1843, completed 1858. Total number of rooms or huts: 9 Ranges of Barracks all of the same construction; besides these, 1 Range for guard room (officers and men). 1 „ School room, non-commissioned officers' quarters, and serjeants' mess room. 1 Range for orderly room, store room, serjeant major and quartermaster serjeants' quarters. 1 Range for canteen and coffee room. Total regulation number of non-commissioned officers and men—1,084.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Doors. Number.	Height.	Width.
								Feet.		Feet.	Feet.
1 Inner Verandah -	18	158	12	16	30,336	1,685	105	2	15	8	4½
1 Centre Room - -	64	172	24	20	82,560	1,290	64		32 openings.	9¼	4
1 Inner Verandah -	18	158	12	16	30,336	1,685	105		15	8	4½
8 Non-commissioned Officers' Rooms.	1	10	20	17	3,400	3,400	200	2	8	8	3
									8	8	4½
12 Family Rooms - -	2	8	20	17	2,720	1,360	80	2½	12	8	3
									12	8	4½
Guard Rooms { Inner Verandah	1 Serjeant 2 Corporals 1 Drummer 28 Privates	52 40 40	12 12 24	20 20 20	12,480 9,600 19,200	1,590	79½	Guard-room and Verandah open all round.			
	32 „										
Inner Verandah - -	—	40	12	20	9,600						
Prison Cell - - -	1 Man	10	8	11½	920	920	80	The Cell has 3 compartments, entrance passage, privy, and cell. Measurement of cell only given.			

5. The barracks are not provided with windows. The doors being half Venetian and half panel, serve the purpose of light and air at the same time. They are on opposite sides. There is a double verandah all round (each 12 feet wide). The outer verandah is never occupied for sleeping purposes by soldiers or other persons.

6. The beds are merely planks resting on wooden trestles; the bedding consists of,—
1 cotton settringer (the size of cot).
2 cotton upper sheets.
1 quilt double chintz to contain 4 seers of cotton.
1 good blanket to measure, when double, 7 feet by 4 feet.

It would be a great improvement if the frames of the cots were iron, with moveable planks between, which could be removed for the purpose of destroying bugs, which abound in all barracks here.

7. The tents in use are two poled.

Height of poles - - - - - - -	10 ft. 3 in.
Length of tent - - - - - - -	21 ft.
Breadth - - - - - - - -	15 ft.
Walls - - - - - - - - -	5 ft. high.

The tents are made of three folds of cotton cloth throughout. They have two flies, but only one kanat. There are 25 men to a tent on ordinary marches, but only 20 on field service.

Cubic space - -	2,190 feet	per man	83.6 feet.
Superficial area - -	315 „		12.6 „

8. The barracks are ventilated by means of openings or ventilators in the side walls, nearly at the top, and plenty at doors. The ventilators are opened or shut at pleasure by means

References to Subjects and Queries.	Replies.
II. Sanitary Condition of Station—*cont.*	of a rope attached to the glass frames, which move on a pivot; besides, the fanlights above the doors are moveable at pleasure. The same system prevails in all guard-rooms and barracks. The tents are amply ventilated by the kanats being raised; besides this, being composed of many parts, there are openings at the junction of these parts which allow ventilation. The barracks are well ventilated, and the air is always pure. No particular means are adopted for cooling the air, but the heat is rendered bearable by the constant agitation of the air by punkahs. The construction of these is simple, being merely a frame of wood covered with cloth, and suspended from the ceiling. 9, 10, 11. The barracks are constructed of stone. The floors are of granite slabs, raised above the level of the ground about 2½ feet, but there is no under ventilation. The material and construction are the best possible and suitable for the climate. With regard to repairs, the barracks and public buildings are under the charge of the Quartermaster-General of the division, and any trifling repairs pointed out by him are carried out without delay by the Public Works Department. In cases of repairs involving a large outlay, the sanction of Army head quarters is requisite. The roads in the cantonment are kept in repair by the prisoners under the orders of the civil authorities. The general sanitary state of the cantonment is supervised by the Superintending Surgeon. The barracks are whitewashed once every year inside. The exterior is only blue washed once in two years, if necessary. 12. There is one lavatory to each range of barracks (9 for men, and 3 for women), one small plunge bath for women, and one large for men, at a distance from the barracks. The lavatories are supplied with water by a channel running from the well which supplies these barracks. They are drained into cisterns, whence the water is removed. The plunge bath is supplied with water from a well attached to it. 13. The cooks are paid by the men; and cooking utensils are provided by Government. Means of supplying water to the cookhouses are abundant, but the drainage is defective. Washing of linen is carried on by washermen at a distance from the cantonment. 14. The contents of the privies are removed entirely twice a day, and thrown away at a distance of two miles from the barracks, on a wide open plain, far from any habitations. 15. The privies have ventilators besides doors. The ventilation might be improved by ground ventilation. Each privy is furnished with a tin oil lamp fastened against the wall. The barracks are lighted by globe oil lamps hung from the ceiling down the centre of the buildings. 16. The barrack drainage is the mere natural drainage of the ground on which the barracks are built. The drainage of the lavatories has been already described. There is none other. No inconvenience has been found from the present state of the drainage. There is no dampness whatever in any part of the barrack or hospital. There is no fluid refuse from the barracks. There are no cesspits nor foul ditches. 17. The surface cleansing is well executed by sweepers and carts, carrying away all refuse to a distance from the barracks and cantonment. 18. There is no excess of surface vegetation, nor anything to interfere with the external ventilation. 19. The sanitary condition of the bazaar is good. The drainage and ventilation have been lately much improved. Much yet to be done. Water supply deficient. Cleanliness well attended to. Two latrines lately built for women. Two more greatly required. The conservancy establishment of the bazaar consists of five scavengers' carts with bullocks, eight sweepers, and four coolies. There are two public privies for females, kept clean by two totties. Two more privies are required. The soil is removed from the village to a distance of half a mile and buried. From the irregular way in which the streets have been built, their confined and crowded state prevents a free circulation of air. The streets should be widened. The main or natural drains or nullahs running through the bazaar should be built up, with stone sides to prevent the water spreading amongst the houses on the banks. Many of the native houses are good, some are mere hovels. In the better class of houses there is generally a cesspool covered in, in order to prevent the women going out for the purposes of nature. This must be injurious to health. There is no nuisance experienced in barracks from native houses. 20. The place for slaughtering cattle for troops is about three-quarters of a mile from the barracks, and a quarter from the bazaar. The offal is carried a further distance of half a mile. No nuisance is experienced. 21. There are few horses in the bazaar. The cattle belonging to the inhabitants are now kept in the yards of their houses. The dung being a valuable article of fuel is collected. The straw and refuse is cleared away daily by the scavengers' carts. Pigstyes are not allowed in the pettah; arrangements are being made for the removal of buffaloes, and the few horses outside the bazaar. 22. There are no stables for the artillery and cavalry except for sick horses. The horses are picketed in the open air. There is no dungheap. The manure is conveyed away by gowlies who purchase it. The horse lines or pickets are north of the men's hutting lines, the nearest points being from 180 feet to 200 feet distance. 23. There is ample accommodation for married people in separate rooms. No married people occupy barrack rooms with the men.
IV. Health of the Troops.	1. Health of the station usually very good. Cholera occasionally, but much diminished from former years. Fever at times, not malarious. Districts adjoining the station healthy. 2. The most prevalent diseases among the native population is fever at setting in of rains, and during N.E. wind, mild. Ophthalmia prevails in the rains. Guinea worm rather common. No spleen disease. 3. The healthiness of the station is attributable to a dry atmosphere and no superabundance of vegetable matter.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	4. The following are the stations, with their influence on health, at which the troops were before coming to Bellary:—D troop, Horse Artillery, at Kamptee; at the station 10 years. Date of leaving it, 20th January 1860. Their health good then; suffered chiefly from disease of the liver and bowels, and venereal. Health good on arrival at this station, 26th March 1860. Been very healthy since arrival.—C Company, 1st Battalion of Artillery, at Bangalore, at the station 18 months. Date of leaving it, 1st November 1855. General health good then; suffered chiefly from fever and venereal. Health good on arrival at this station, 20th November 1855. Since arrival, have chiefly suffered from fever and venereal. No part of the present accommodation for troops at this station is more unhealthy than the rest. 5. The troops are not camped out. 6 to 13. No experience of hill stations, or of their adaptation to European troops. 14. At so healthy a station as Bellary, I do not see the advantage of locating the whole regiment at a hill station. But a tour of residence each year would be desirable for mind and body, and this might be easily effected on the Ramandroog. I do not think a frequent change called for, neither should a regiment be too long, beyond three years, at a station. The change alluded to above would render this less called for. 15. There has been sufficient hospital accommodation at the Ramandroog for the number hitherto sent, but the barrack accommodation is deficient. Much hospital accommodation should not be required where a careful selection of the cases sent is made. 16, 17, 18. No personal experience as to best elevations for health. About 3,000 feet appear most suitable. 19. With regard to the best age for sending soldiers to India, they should not be growing youths, but young men; the minimum age 21, but if a few years beyond, the better. They should arrive in India in November. 20. As regards the benefits of intermediate stations, statistics prove that troops that have been intermediately at the Cape lose fewer men in India than when they have come out direct from England. To diminish the dangers of the earlier years of service, troops should not be stationed on first arrival on the Coromandel (with the exception of Vizagapatam) or Malabar coasts; but I see no objection to the inland stations of Bangalore, Bellary, Trichinopoly, Secunderabad, particularly the two first. 21. The usual mode of transport inland is by rail, where such is available. Regiments usually march. Small detachments by bullock transit when procurable. 22. As regards length of service in India, the sanitary condition of the soldier has been lately so much improved in Southern India that there is no reason why he should not serve as long in this country as in any other part of the world. 23. As regards the constitution of medical boards, there may be difference of opinion. But the majority must decide in each case. 24. Invalids should leave India for home early in the year.
Diseases.	1. Inspections for the discovery of disease are made weekly in the 74th Highlanders. 2. There has been no scorbutus for many years past. 3. There have been 124 cases of hepatitis, acute and chronic, out of 3,313 = 3·77 per cent. of all other diseases during five years. But this is beyond the actual number, because an individual may be admitted several times, and this would count as so many cases. Besides many are returned chronic hepatitis for want of a designation for mere derangement of the liver. I do not regard hepatitis as the consequence of other diseases, though it may be associated with them, particularly dysentery. Certain individuals are subject to it; often the intemperate. Less spirits, or better, none, would be the best prophylactic. 4. Dracunculus seldom occurs among Europeans at this or any other station I have been at. 5. Venereal diseases have occurred in the proportion of 40 per cent. of the constantly sick for many years past at Bellary. The best remedy, marriage; a present cost with an eventual great saving to the State. It would be very advantageous to have lock hospitals, provided they were efficiently worked. They could be usefully and economically connected with civil hospitals now established at all large military stations. The per-centage of cases of venereal disease has been considerably reduced within the last few months by health police arrangements. 6. The epidemic and endemic diseases at the station are:— *Intermittents* in the cold season; sometimes remittents, not severe; ephemeral or short continued fever in the hot season. *Dysentery* has not of late been epidemic, nor is the disease generally malignant in character. *Cholera* takes place every three or four years, but the number attacked is few compared to former years, although the deaths to attacks are more. *Small-pox* is sporadic now and then. *Rheumatism* frequent, often complicated with syphilis. The following Table shows the proportion of admissions and deaths from these diseases to the total admissions and deaths for five years—1854–5 to 1858–9.

Diseases.	Admissions per cent. to total admissions.	Deaths per cent. to total deaths.
Fevers, Intermittent	8·61	0·0
„ Remittent	1·88	0·0
„ Continued	1·77	6·88
Bowel complaints	5·17	20·41
Cholera	0·74	17·24
Small-pox	0·0	0·0
Rheumatism	5·91	0·0

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	7. Fevers are most frequent during the cold and hot seasons. The atmospheric conditions which accompany them are dry easterly winds from November to February. Hot sun in the day, cold and sometimes dewy nights, when intermittents prevail. High and dry temperature when ephemeral and continued fevers prevail. Fever also prevails among the inhabitants of the town in the cold season and at the setting in of the rains, attributable to the effect on the skin, not to particular localities or malarial emanations, also to clothing of the natives, insufficient to protect them from cold and damp, and poor diet among the lower classes. 8. No answer. 9. Quinine has not been tried as a prophylactic, there being no malarial diseases at this station. 10. (No recommendations as to prevention of epidemic diseases.) The only epidemic of late years has been cholera.
V. Intemperance.	1. No replies. 2. Drunkenness is always punished as an offence. 3. Distilled spirits are sold in the canteens to soldiers; in the bazaars to natives only. Spirit forms no part of the soldier's rations. The issue of a dram before morning parade is prohibited. Spirit is never given as a ration to convalescents. 4. As to health and discipline, the less spirit consumed the better for health, and anything that leads to drunkenness is fatal to discipline. 5. It would be highly advantageous, I believe, to abolish altogether the use of spirits from the canteen and bazaars, restricting their use to particular occasions. The habit for spirits is maintained by the authorized use of them. 6. Malt liquor or wine, even if exceeded in, must be less hurtful than spirits. Taken in moderation, the former is preservative of health, and is now issued regularly to the European troops. 7. Coffee, tea, lemonade, soda water, and similar drinks are much used, except soda water, which is too expensive. 8–10. It would be very beneficial to suppress altogether the use and sale of spirituous liquors in the canteens, and to permit only beer, coffee, tea, lemonade, &c., to be sold to the troops. 11. The bazaar regulation is that no spirits or intoxicating liquors of any kind shall be sold to the European soldier, which is very generally observed.
VI. Diet.	1. The following is the ration of—

	Queen's troops.	European troops of the Indian Army.	
Bread	1 lb.	1 lb.	
Meat	1 lb.	1 lb.	mutton 2 days, beef 5 days per week.
Rice	4 oz.	4 oz.	
Tea or coffee	⅔ oz.	tea ⅔ oz.	
Sugar	2½ oz.	2½ oz	
Salt	1 oz.	1 oz.	
Potatoes	½ lb.	—	
Vegetables (onions, pumpkins, carrots)	½ lb.	1 lb.	varying according the season.
Firewood		3 lbs.	

	The meat ration is prepared as the soldier wishes, either in curry, stew, boiled, or fried. No periodical changes have been made, nor are any requisite. The ration is inspected by the regimental authorities. 2. The soldier's ration is ample and excellent. The usual vegetables at Bellary are ¾ lb. of potatoes and ¼ lb. of pumpkins and onions mixed. 3. No improvement in the ration is required. 4. Cooking is done in the ordinary Indian cookhouse with native cooks. The cookhouses are light and well ventilated, and have a sufficient supply of water. Smoke soon blackens the walls. The cooking is sufficiently varied. On march, tea and coffee are usually supplied half way. This is a regimental arrangement. 5. Soldiers' gardens for the cultivation of vegetables under regimental management would be advantageous near the station.
VII. Dress, Accoutrements, and Duties.	1. In cold and rainy seasons the soldier's dress consists of woollen. In the hot, of cotton. Accoutrements the same all the year round. The dress is suitable to the climate both for day and night duties, with the exception that the 74th, being a Highland regiment, wear woollen trousers all the year round, which appears to be objectionable. At all seasons the men go on guard with their great coats.
Duties.	1. With reference to the propriety of drilling men before their arrival in India, every man on joining a regiment for the first time must be drilled. 2. The guard and parade duties are both very light, and can scarcely be prejudicial to the health of the soldier. The soldier is seldom kept under arms beyond one hour, and that four times a-week. The best hours for drills, parades, and marches are in the early morning. In marching troops should reach their ground soon after sunrise. The 74th Highlanders have 5 nights per week in bed; native soldiers, 3½ nights per week. 3. Guards are mounted at various distances from barracks. The men are on duty for twenty-four hours. Roll calls depend on commanding officers and the state of a regiment. Night duty is so light that it cannot be prejudicial to health.
VIII. Instruction and Recreation.	1, 2. The following are the means of recreation:—A ball court is under construction. There are schools and skittle grounds. A library and reading room will shortly be constructed. There is also a theatre. There are no day rooms or soldiers' clubs. No soldiers' gardens, workshops, nor gymnasia, although all would be very desirable. A covered place for recreation both for the wet season and during the heat of the day is also very desirable. There is no restriction on the men exposing themselves to sun or rain when off duty. More trees for shade should be planted. 3. Soldiers' saving banks have been already introduced with great advantage.

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References to Subjects and Queries.	REPLIES.
IX. MILITARY PRISON.	1. There is no military prison. Prison rooms and cells attached to regiments are properly ventilated. Overcrowding can scarcely be allowed in a well-ordered regiment.
X. FIELD SERVICE.	1, 2. There are no local regulations for medical field service not included in the general Presidency regulations. 3. On all matters connected with the preservation of the health of the troops, such as selecting camping grounds, sanitary regulations, ventilation, water supply, &c., it is the duty of the medical officer to advise his commanding officer. 4. The transport of sick, of hospital supplies, &c., is done by doolies and sick carts. Much need of improvement in the latter. In general everything connected with field hospitals is most efficient in this country.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information.
XII. HOSPITALS.	1. A new hospital is under construction at this station. 2. It is 166 yards from the barracks, 230 yards from the stables, and about a mile distant from the civil population. The site is very open, and there is nothing to interfere with the ventilation. The site is very healthy, as regards elevation, natural drainage, absence of malaria, &c. 3. The water supply is wholesome, but not very abundant. 4. There are no drainage arrangements. This is a matter yet in consideration. 5. The lowest wards are raised three feet above the ground. No perflation beneath the floors. No provision is made for conveying away the roof water. The natural slope of the ground admits of free drainage. The hospital is built of granite stone and Chunam-terraced roof single; walls single, and sufficiently thick to keep the building cool. There are double verandahs all round, each 12 feet broad, sheltered from sun's rays. They are not intended to be used either for sick or convalescents. The hospital is two stories high. The following Table gives the accommodation. Date of construction, commenced in August 1857, and still progressing. Total number of wards, 9. Total regulation number of beds, 174.

Wards.	Regulation Number of Beds per Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
								Ft.		Ft.	Ft.
4 men's (each)	22	40	40	20	32,000	1,454	73	2 (about)	35	6½	5
2 do. do.	28	60	40	20	48,000	1,714	86	2 do.			
1 do. do.	10	40	18	20	14,400	1,440	72	2 do.			
2 women's (each)	10	40	18	20	14,400	1,440	72	2 do.	2	6½	4
									1	5	5
									1	5	4

	The hospital is so placed as to receive the full benefit of prevailing winds. The windows open in the ordinary manner on hinges. The building is well ventilated by large doors. The larger wards have doors only, which will ensure ventilation and coolness. 6. The means of ventilation are quite sufficient. There are the usual Venetian blinds. 7. Punkahs are used for cooling the air. 8. There are two fire-places for warming the wards. 9. The privies are in detached buildings about 45 feet from the hospital. The communication is by ventilated corridors. There is no drainage. Everything is carried away, and if properly attended to, ought not to be offensive. 10. The lavatory arrangements are under consideration. 11. Bath rooms have been provided with the necessary apparatus. Ward walls and ceilings are lime-washed when necessary. 12. The hospital linen is washed and dried away from the hospital. 13. The storage is under construction. 14. The iron cot is ordered for all hospitals, and not yet fully supplied. 15. A kitchen for the hospital is under construction, but the means and apparatus are entirely Indian and of the simplest kind. 16, 17. Diets, attendance, &c. according to regulations. 24. There are no separate wards for convalescents, a separate ward and separate messing would be very advantageous.
XIII. BURIAL OF THE DEAD.	1. The burial ground is about 1½ miles from the European infantry barrack. The distance is very inconvenient. That for Roman Catholics is about a mile distant. 2. Area of ground, 4 acres, nearly, for Protestants; 2¼ acres for Catholics. There are no fixed rules as to size of grave space. Graves are dug six feet deep, and never re-opened. Burial takes place usually within 24 hours; in some cases sooner. 4. The grave-yard is never offensive. 5, 6, 7. The native dead are burned or buried. No injury to health occurs from the practice. Natives do not like to be interfered with in the disposal of their dead.

12th May 1860.

J. C. COFFIN, Major-General commanding Ceded Districts and Bellary.
E. W. EYRE, Superintending Surgeon, C. Vts.
JNO. F. FISHER, Captain, Madras Engineers.

JAULNAH.

Accommodation
- Queen's Troops
  - Artillery, Horse—1 Troop - - - 115
  - Infantry—No. Barracks, 3 Companies of H.M. 18th Royal Irish Non-commissioned Officers and Men occupy private dwelling houses - - - 312
- Native Troops
  - Cavalry—1 Regiment - - - 377
    Three squadrons, but place of arms for 4 squadrons.
  - Infantry—2 Regiments - - - 1,640

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is hilly, but not mountainous. Close to the cantonment it is undulating, and intersected by ravines. It is entirely devoid of wood or jungle, a few trees are only found in officers' compounds and gardens, and along the bazaar roads. There is no standing water in the vicinity. A small river flows near the cantonment, and there is a large tank three miles away.
	2. The elevation of the station above the sea is 1,652 feet, and it is lower generally than the surrounding country. The nearest nullah is the Seo, which falls into the Koondulka river close by. The elevation of the lines above the Seo nullah is about 50 feet. There is no marsh near the station. It is surrounded by low hills, their elevation being about 180 or 200 feet. No advantage would be gained by a removal of the station, especially as there would be very great difficulty in procuring water.
	3. There are irregular hills, as above mentioned, at an average distance of about 2 miles, which enclose the station in an amphitheatre. The nearest high table land is that of Roza, 55 miles by road from this station. This range is about 1,153 feet above Jaulnah, and 2,805 feet above the sea. Booldana, a small village situated on the elevated table land on the Adjunta and Lackenwarra range of hills, about 4 miles from Darulghaut, and about 60 from Jaulnah, is highly spoken of for its mild, dry temperature and pure air, and is said to be well adapted for a sanitarium. The height of this place is not known, but it is supposed to be higher than the table land of Roza. Its distance from Jaulnah is about 60 miles in a northerly direction. Should it be proposed to establish a sanitarium in the neighbourhood of Jaulnah, both these spots should be visited, and examined by competent persons.
	4. The Seo nullah and Koondulka river flow close to the station, and the old Jaulnah tank is distant about 3 miles. The country is not subject to an overflow of water. During the rainy months the nullah and river come down suddenly, and are impassable for a few hours together, but they do not submerge the surrounding country. There is broken ground and ravines, but no water pits. No bad effect on the health of the station is produced by them.
	5. The station is open, and freely exposed to winds. Not a tree or shrub is to be seen beyond the gardens round the houses. Care is taken to keep the hedges cut down to 4 feet, and the lower branches of trees lopped off to within 6 feet from the ground. These do not in any way interfere with the free circulation of air. The buildings are not near enough to each other to be affected by reflected sun heat. It is not exposed to cold or variable winds. The land or dry westerly winds blow during the months of March, April, May, and June, and many consider this the healthiest season. The station is too far from the sea for the breeze from it to reach it.
	6. Beyond three or four large gardens there is no cultivation on the cantonment side, but beyond the Koondulka river, near old Jaulnah, there is some trifling cultivation. There are no works of irrigation near the station. No rice is cultivated, the ground being totally unfit for anything of the sort. There is no indigo, but there are a few acres of hemp a mile and a half from the cantonment.
	7. Khaderabad, a large walled town, adjoins the military cantonment and bazaar. Beyond the river Koondulka, at a distance of 1½ mile from the lines, is old Jaulnah.
	8. The hills are chiefly composed of trap rock, which in many places is in a decomposed state, covered with layers of red gravel or lateritious soil containing lime. The subsoil is generally black cotton subsoil. The surface is barren. The station has been formed for many years, and the ground was not previously occupied.
	9. Water is usually found during the dry season at a depth of 30 or 40 feet, certain at 60. During the rainy season in an average monsoon the wells are generally quite full.
	10. The rain water (there being no water from surface springs) flows off readily and does not lie on the surface anywhere. The numerous small nullahs and ravines which intersect the country form a natural drainage and carry off the water. No drainage from higher ground necessarily passes into the subsoil of the station.
	11. The water from the river and nullah is generally used by the natives. The European and native troops have a good supply from wells which are found in every compound and in the bazaar. It is not collected nor stored in tanks. The tank at old Jaulnah has generally water in it throughout the year. In the dry season there is often a scarcity of water, the wells becoming dry; water is then chiefly obtained by excavating holes in the sands in the bed of rivers and nullahs. Wells might no doubt be sunk in places where there would be ample water at all seasons. There are no plants found in the tank and only a few fish. No water is used both for drinking and bathing. The wells are not liable to pollution, and no nuisance or malaria proceeds from the tank.
	12. The water supply is obtained from the Seo nullah, the Koondulka river, and from wells. The river and tank water is good and wholesome. In many wells it is brackish and saline, but in others it is excellent. It is devoid of smell. Lime and nitre are contained in the water of most of the wells, especially the latter. It is generally hard and clear. Microscopic investigations have never been made. The water for drinking is good and not injurious to health. The supply is generally sufficient, but in the dry weather there is often a scarcity. It is raised by manual labour and by bullocks. The wells generally require deepen-

JAULNAH. MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	ing from 15 to 20 feet according to situation, which if done there would always be an abundant supply of water obtainable. 13. The health of the station is excellent. Any additional troops, especially European, would necessarily be located on the higher ground to the north-east of the present lines. 14. We are not aware of any new station having been formed for many years, but conclude that the position would only be decided on a report made to his Excellency the Commander-in-Chief by a committee formed of the senior officer at the place, an officer of the quartermaster-general's department, the senior medical officer, and engineer, or other competent persons.
II. CLIMATE.	1. There are no instruments at present for conducting meteorological observations. 2. No materials for a meteorological table are to be found, the records having been removed when the station was abolished. 3. The climate is generally salubrious; dry and cold, yet liable to great sudden variations of temperature. Fogs and damp are rare. The air is pure, rarely containing dust or any other extraneous matter. Its influence on health is salutary. The usual diet is sufficient and good; the barracks good, and the clothing is required to be suitable according to the change of seasons, consisting of flannel and cloth in the cold, and flannel and cotton in the hot months. Drills should be regular, never exceeding one hour's duration, and in the hot weather only in the morning, to terminate at half-past 6 at latest. By the returns, December and January are the most healthy months; August, September, October, and November, generally the reverse. During the unhealthy months, fever, dysentery, diarrhœa, and rheumatism are the prevalent diseases. 4. No neighbouring station, so far as we are aware, possesses a character superior to that of Jaulnah. The high land near Roza and Booldana, already mentioned, would no doubt be found suitable as a sanitarium. 5. The stations at which I have served are Madras, St. Thomas's Mount, Poonamallee, Vellore, Nellore, Bangalore, Secunderabad, Mangalore, Masulipatam, Samulcattoh, Vizianagram, Cuttack, Moulmein, the Straits, Aden. We consider the Straits, Moulmein, and Bangalore the most salubrious stations for Europeans. Many of the others where European troops are stationed, though very hot during the hot season, are none of them positively injurious to health.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Maps and plans. The detachment of the 18th Royal Irish occupy bungalows built as quarters for officers. The men of the native cavalry and native infantry reside in small huts erected by themselves, their arms alone being kept in the place of arms or barracks. 4. The following table shows the barrack accommodation.

Date of construction, not known.
Total number of rooms or huts, 10.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		Feet.	Ft.	Ft.				Feet.		Feet.	Feet.
1 Range - - -	62	176	21	17	62,832	1,013	59	2½	18	4½	3½
2 Range - - -	35	103	21	17	36,771	1,053	61	2½	13	4½	3½
6 Quarters for Serjeants.	6 Serjeants, with their families.	39	21	17	Depends on the number in each family.						
2 Quarters for Staff Serjeants.	2 Staff Serjeants, with families.	18	12	10½				2½	14	4½	3½
Guard Room - - -	12	46	16	13	9,568	797	61	2½	8	4½	3½
2 Prison Cells, one on each side of Guard-room.	According to circumstances, but never too many, or over crowded.	16	14	13	2,912	2,912	224	no Cots.	2 grated openings in each, out of the men's reach.	3	2

5. In the Horse Artillery barracks the windows are placed opposite the doors, being all on one side. They are in two leaves, open inwards, and are glazed. Between the doors there are also windows, as shown in the plan. There are verandahs on both sides, along the front and rear. The former, which is open, is 10 feet wide, and the latter, which is closed, 8 feet, having windows only. The verandah is not used as a sleeping quarter, except in very hot weather, when the nights are oppressive, and some of the men bring their bedding out to obtain relief from the heat inside. In the back enclosed verandah the mess tables stand, and the men take their meals there. There are no jalousies or jhilmils.
6. The cots have been hastily made up for immediate use on the re-occupation of the station last year. They are common-roughly-made frames of jungle wood, with netting of coir rope. New ones are about being constructed and iron cots supplied. The bedding consists of a carpet, quilt, blanket, and sheets.
7. The tents used by Europeans consist of two flies and one kanat or wall, supported by two poles, on which rests the ridge pole, with openings front and rear. The length is 20 feet, breadth 15 feet, height to the ridge of the inner fly, 10 feet; height of the kanat, 5 feet; space between the inner and outer fly, 1½ feet; cubic space of air per man, 90 feet; superficial area per man, 12 feet. Number of men in each tent, 25. The tents in use with the native infantry consist of a fly supported on two poles and a ridge pole; opening in front for entrance; no kanats; length 22 feet; breadth 13 feet; extreme height, 9 feet, sloping down to 1 foot; cubic space per man, 57 feet; superficial, 11 feet.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	8. Ventilation is by doors, windows, ridge ventilators, and fanlights placed between the slope of the roof and that of the verandah front and rear. The ventilation is good and generally quite sufficient in the Horse Artillery barracks, but the patchery inhabited by the families and the huts of the Native Infantry and cavalry are very deficient, but this suits a native, as he objects to free ventilation. Punkahs are allowed to the European barracks, as also kuskus tatties during the hot weather, which being watered render the buildings cool. The structure of these two articles are too well known to require describing in a sketch. 9. The Horse Artillery barracks are constructed as follows:—Basement, stone in chunam; walls, brick in chunam; plastered interior and exterior; roof, teak wood, couples and collar pieces, and tiles; doors, of teak, opening with two leaves 7 feet by 3½; windows glazed. 10. The floors are raised 3 feet above the ground, of stone slabs in chunam. There are no air passages beneath. 11. The materials used in construction are suitable for the climate. These buildings are not on the standard plan, being now built some years. All the improvements one can think of or suggest are included in the standard plans, which are to be followed on all future occasions. The officer commanding is responsible for the state of the cantonment. Under his directions it is kept in order, and the repairs are made to the barracks and public buildings by the department of public works. No delay takes place in their execution when necessary. The barracks are cleansed and whitewashed as often as is found necessary. 12. There are two lavatories to the Horse Artillery barracks. The wash-houses and baths are supplied with water by puckalies. These buildings are deficient in size and commodiousness, and are capable of improvement. A plunge bath would be a great convenience and comfort. 13. There is a cook-room to each range of barracks, also a small one for the married men: a new one is required nearer their quarters. The usual means of cooking in India are provided. Water is brought by puckalies, and the refuse water is carried off by a closed drain into the main drain. This is susceptible of improvement. Clothes and linen are washed by regular paid washermen. Conveniences for the purpose are not therefore required. 14. The night-soil, &c., is removed twice a day by men employed for the purpose. The privies are furnished with wooden seats, and buckets or chatties are the receptacles for the filth. 15. They are ventilated by spiracles in the walls and ridge ventilators, and lighted by small windows and lanterns at night. The barracks have globe lamps. 16. A masonry drain surrounds the barrack; the smaller ones for the lavatories, baths, and cook-rooms empty themselves into it. The main drain is carried to the extreme verge of the barrack limits, passes under the public road, and empties itself on a piece of waste ground, about 150 yards from the barracks. It would be an improvement to prolong the drain to a distance of 900 feet, the ground gradually falling towards a nullah. The dimensions of this drain is two feet by two. The drain is sufficient. The privies and urinals are supplied with cesspools, which are fitted with tubs. These are emptied twice a day and carried to a distance. No part of the barrack or hospital is damp. There are no foul ditches. 17. Scavengers' carts remove all filth and dirt daily, and the cantonment is kept perfectly clean. The refuse, manure, &c., are carried to a distance and taken away for gardens. 18. The surface of the cantonment is kept free from vegetation. No old walls, hedges, or anything of the sort is allowed to exist. 19. The ground on which the bazaar stands slopes down gradually to the nullah at the back of the cantonment; the surface drainage of the streets, &c., is consequently good. There is a good wide street running from one end of the bazaar to the other. The ventilation in this part is good, and improvements are in progress to open out many of the narrow side streets, and to form good wide roads. The place is at present crowded, but new roads are being formed. The supply of water is confined to the wells in the bazaar, and the water of the Seo nullah. The place is clean, the inhabitants, like all other Indian places, going to a distance for the purposes of nature. Every house owner is obliged to keep the portion of the road in front of his house in order, by having it swept once a day. The sweepings are removed by a cart kept by the police. The native houses generally are in good order, and of substantial materials, but there are a good many in a most wretched condition. There are no dung-heaps, and the natives are so well aware of the value of manure, that it is speedily removed. There are no cesspools outside the houses; as to whether there are any *within* them I am not prepared to say; as the liquid refuse is trifling, their existence as a general rule is unlikely. There is no nuisance, that we are aware of, from winds blowing over native dwellings, but the patchery, adjacent to the south range of barracks, apparently shuts out a great deal of air, as that range is excessively hot and close at times, when the opposite one is comparatively airy. The European patchery is much too close to this range too. The patcheries, and more especially that occupied by the married Europeans, should be removed to a greater distance. 20. Animals are slaughtered at a considerable distance from the barracks, but slaughter-houses and butchers' shops have been the chief nuisances in the bazaar, and though the offal is removed there is often much stench near these places. Arrangements are being gradually made for the removal of all these objectionable places beyond the precincts of the bazaar. 21. Owing to the expense of forage but few horses or ponies are kept in the bazaar. Those who have them keep them in their own houses and yards. They are not, however, objectionable, as the dung is at once removed for manure or burnt, and no accumulation is allowed to take place. 22. There are no stables except those for sick horses. The horses are picketed in the open air. The sick stables are about 300 yards from the barracks, and consist of a range of stalls supported in the middle by a row of pillars, with a wall on one side, with ventilators or openings in the wall, and a row of arches in front. They have also ridge ventilators. The accommodation is for 12 horses, besides 4 loose boxes, a casting shed, farriers' room, and two small surgeries. The dung-heap is in a line with this building, and at 300 and 500 yards from the barracks and hospital respectively. The manure is sold and carried away periodically by the inhabitants of the neighbouring villages. The above refers to the Horse Artillery stables; those of the cavalry are something similar, but more extensive. They are situated about 300 yards from the native cavalry hospital, and 800 or more from the men's huts. The horses of both artillery and cavalry are picketed in ranges or lines of troops facing each

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	other, with a wide road running between each range. Each troop is separated from the others by a low mud wall, and a similar wall encloses the whole. The horses of the artillery are at about 80 yards from one end of the barracks and 200 from the hospital. 23. There are not sufficient quarters for the married men drawing the Government allowance. Those who have not quarters reside in the patchery, but no married people occupy the barrack rooms with the men. The patchery is private property, and consists of the most miserable hovels, badly situated, devoid of ventilation, and unfit for Europeans to live in.
Officers' Quarters.	1. The officers occupy private houses, which are generally good and healthy. Some might be improved as regards ventilation by having ridge ventilators. The drainage is good, the ground sloping naturally down to the river. I have no improvements to suggest.
V. HEALTH OF THE TROOPS.	1. The station and the adjacent native population are healthy. 2. The most prevalent diseases are fevers, intermittent and remittent. Spleen diseases are rare. 3. The healthiness of the native population is to be attributed to the salubrity of the climate and of the district, and their general industrial prosperity. 4. The Horse Artillery at this station came from Secunderabad, where it arrived in January 1858, and left again on field service in November 1858, and arrived at Jaulnah in March 1859. The health of the troops at Secunderabad was not so good as as at the previous station, Trichinopoly, the men having suffered from fevers, diarrhœa, dysentery, and liver. There was a good deal of sickness on the arrival of the troops here from field service, but they have improved here. Fevers are rather more frequent, but liver and bowel complaints less frequent than at Secunderabad. The three companies of the 18th Royal Irish were at Assurghur, Poona, and Ahmednuggur, then on field service, and arrived here in March 1859. Their health before coming was generally good, but suffering at times from fevers and venereal. The 2nd Cavalry was at Sholapore for two years and two months, and left it on the 21st April 1859. Whilst there the regiment was healthy; the diseases from which the men suffered at all were fevers, ephemeral, quotidian, or intermittent, rheumatism, phlegmon, and contusions. They arrived at Jaulnah on the 6th May 1859 in a healthy state, and have since been remarkably healthy; the principal diseases have been fevers, intermittent and quotidian, rheumatism, and contusions. The 9th Regiment N.I. was last stationed at Secunderabad for about 10 months, and left it on the 15th November 1858, when the men were healthy, but during their sojourn there they had been sickly, suffering chiefly from intermittent fevers of the quotidian type, diarrhœa, and rheumatism. On arriving here on the 13th March 1859 the men were generally in good health. Since that, though generally healthy, they have suffered chiefly from ephemeral and quotidian fevers, rheumatism, purulent ophthalmia, and syphilis. The Native Infantry show a higher average of sickness than any other corps or detachment, which is partly to be attributed to the deficient ventilation of their huts and lines, and partly to the great amount of guard and sentry duties, especially at night, performed by them. 5. The men are never camped out, but I consider that it would be beneficial to their health if it were occasionally done. 6. We have never been in charge of troops at hill stations. 7. We have no experience as to the effect of hill stations on health after returning to the plains. 8. There can be no doubt, we think, that hill stations are preferable for troops. 9. There are no diseases that we are aware of peculiar to hill stations. 10. The diet, clothing, and exercise ordered must be suitable to the climate of the particular hill station. 11. The hot season is best adapted for a residence at the hills, say from April till August inclusive. For newly arrived troops a residence of two years on the hills is desirable; for acclimatized troops, 6 months. 12. There is no period of residence at the hills, beyond which injury to health is likely to be inflicted on returning to the plains. 13. The precautions to be observed on returning from the hills are simply light clothing and a less generous diet. 14. As a general rule we certainly consider it advisable that the European troops should spend the hot season on the hills and the cold season on the plains. A too frequent change of stations on the plains is not advisable. 15. We cannot offer an opinion as to the sufficiency of accommodation, never having been at any hill station or sanitarium. 16. I do not know at what elevation suitable sites may be obtained. 17. The only place near Jaulnah which might perhaps be advantageously occupied in consequence of the height is *Roza*. It is 55 miles distant from this place by road, in a north-west direction, and its height is 2,800 feet above the level of the sea. The access is easy, and the climate several degrees cooler than that of Arungabad or Jaulnah. During the greater part of the year Booldana, in a northerly direction, is said to be a healthy cool spot. Its distance from Jaulnah is about 60 miles; the elevation is not known, but is supposed to be equal, if not higher, than Roza. It is the head quarters of the deputy commissioner of West Berar in the Assigund District. Supplies would therefore be obtained with more facility than at Roza. 18. We are not aware that any surface or subsoils are more healthy or unhealthy than others. 19. The best age for soldiers proceeding to India is from 19 to 23, and from November to February is the best time for them to land. When a regiment arrives in India it must depend on the station it is to go to whether it proceeds by sea or land. If it lands at the Presidency it must be encamped. Recruits proceed to the depôt, and are sent to join their respective corps as may be found convenient, either by sea or land. The precautions to be observed are simply restriction to barracks from 10 a.m. to 5 p.m., encouraging bathing, regular exercise, and temperance in every respect. 20. We are of opinion that two years residence at any one of the intermediate stations between England and India, such as the Cape of Good Hope or Mauritius, is advisable. The troops on landing should be sent to a hill station. 21. The troops from the port march by land, if proceeding into the interior; if to a station on the coast, by steamers. The marches should be short, and terminate at 7 a.m., when the tents should be up and pitched, and the men get under cover and have their breakfasts as soon after as possible.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	22. A British soldier should serve in India from 12 to 15 years. 23. We have no suggestions to offer as to the mode of conducting medical boards, &c. 24. January and February are the best time of the year for invalids returning home.
Diseases.	1. There are regular inspection parades for the discovery of disease once a week. Different regiments have different times for inspection. 2. There is no scorbutic disease, nor has there been any. 3. The proportion of cases of hepatic disease are 9 or 10 per cent. per annum, caused by intemperance and general unnecessary exposure to the climate. It is not generally the result of other diseases. The best precautionary measure would be stopping the sale of intoxicating liquors. 4. There are no cases of dracunculus known to originate here. Those at any time in hospital have been engendered at other places. 5. The proportion of venereal cases is 10 per cent. The best means of preventing the liability of the soldier to this disease would be the frequent inspection of the prostitutes, and the establishment of lock hospitals. 6. Troops are found to suffer from epidemic and endemic diseases when prevalent. Fevers, intermittent and remittent. Dysentery, more generally dysenteric diarrhœa. Cholera, the collapsed type chiefly. Small-pox, varying in severity. Rheumatism, acute and chronic. The detachment of the 18th Royal Irish left the station before furnishing the information called for. For the year ending 31st March 1860, the proportions were as follows :—

Corps.	Fevers.		Dysentery.		Cholera.		Small-pox.		Rheumatism.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
B. Troop M.H.A. -	1 in 4	—	1 in 2⅕	—	1 in 122	—	—	—	1 in 16¼	—
9th Regt. M.N.I. -	1 in 4	1 in 15	1 in 4½	1 in 15	1 in 52⅔	1 in 7½	1 in 66	1 in 15	1 in 12½	—

7. Of the eruptive fevers, small-pox is the only one that is met with. Of the fevers, the remittent and intermittent are the most prevalent, the latter chiefly; cholera sometimes prevails as an epidemic, formerly the outbreaks were frequent and extensively fatal, but of late years they have been more rare and less severe, though occasionally still causing a considerable mortality. The hot and wet seasons are the periods when zymotic diseases are most prevalent. In the former, small-pox and cholera generally prevail, but it may also occur in the wet and cold weather. During and after the wet season, fevers are intermittent and remittent. They are preceded or accompanied by a close and hot state of the atmosphere. Disease is not more prevalent in any one portion of the station or bazaar than in another. Intemperance and exposure to sun and rain, or partaking too freely of unripe fruit or crude vegetables, predispose to these diseases.
8. The duties and habits of European troops, both in cantonment and in the field, no doubt exercise an injurious influence on the system, and predispose to epidemical disease.
9. Quinine has not been tried as a prophylactic.
10. We have not had sufficient experience at this station in regard to epidemic disease, but would recommend that all means be used to keep the place and cantonment clean and well drained, all nullahs clear, and compounds free from rank vegetation, and hedges and trees cut low.

V. Intemperance.	1. The soldiers at the station are temperate on the whole. None of the men at present can be called confirmed drunkards in the troop of Horse Artillery; but about 14 in the detachment of the Royal Irish. Those of the Artillery who would have come under this denomination took their discharge last year. 2. There are no records as to the proportion of admissions to hospital caused directly or indirectly by intemperance. The following Table is for the B. troop, Horse Artillery. Drunkenness is punished as an offence.

B. Troop Madras Horse Artillery.

Return showing the Total Number and Ratio of Admissions and Deaths from each Class of Diseases for the Year ending 31st March 1860, with the same for each separate Month, arranged under three Classes, of "Teetotalers," "Temperate," and "Intemperate;" with the Monthly and Annual Average Strength of the Troops, and the Monthly and Daily Average of Sick, not including Commissioned Officers.

Year and Month.	Fevers.			Eruptive Fevers.			Diseases of the Liver.			Diseases of the Lungs.			Diseases of the Stomach and Bowels.			Diseases of the Brain.			All other Diseases.			Total of all in each Class.			Deaths.			Total of Deaths.	Total Admissions for the Month.	Strength for the Month.	Average Daily Sick for the Month.	Remarks.
	Teetotalers.	Temperate.	Intemperate.	Teetotalers.	Temperate.	Intemperate.	Teetotalers.	Temperate.	Intemperate.	Teetotalers.	Temperate.	Intemperate.	Teetotalers.	Temperate.	Intemperate.	Teetotalers.	Temperate.	Intemperate.	Teetotalers.	Temperate.	Intemperate.	Teetotalers.	Temperate.	Intemperate.	Teetotalers.	Temperate.	Intemperate.					
1859. April -	–	7	1	–	–	–	–	3	1	–	1	–	–	8	1	–	–	–	–	3	3	–	22	6	–	1	1	2	28	109	13¾	Both deaths were from disease of the liver.
„ May -	–	7	1	–	–	–	–	1	3	–	2	–	–	4	1	–	–	2	–	8	2	–	22	9	–	–	–	–	31	108	13	
„ June -	–	–	–	–	–	–	–	–	1	–	–	–	–	4	2	–	1	2	–	7	4	–	12	9	–	–	–	–	21	110	11¾	
„ July -	–	–	–	–	–	–	–	–	3	–	–	–	–	5	1	–	3	1	1	7	1	1	15	6	–	–	–	–	22	110	7¼	
„ August -	–	4	4	–	–	–	–	1	–	–	2	–	–	2	–	–	1	–	–	8	1	–	17	6	–	–	–	–	23	109	6⅝	
„ September	–	7	2	–	–	–	–	–	1	–	–	–	1	1	–	–	–	2	–	3	–	1	11	5	–	–	–	–	17	84	4½	
„ October -	–	4	3	–	–	–	–	–	–	–	1	–	–	1	–	–	–	–	–	2	–	–	8	3	–	–	–	–	11	82	3¾	
„ November	–	5	1	–	–	–	–	–	1	–	–	–	–	2	1	–	–	–	–	6	–	–	13	4	–	–	–	–	17	108	4½	
„ December	–	1	3	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	7	3	–	9	6	–	–	–	–	15	108	5¼	
1860. January -	–	1	1	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	5	3	1	7	4	–	–	–	–	12	108	8⅔	
„ February -	–	3	1	–	–	–	–	1	1	–	1	1	–	2	1	–	–	–	–	6	1	–	13	5	–	–	–	–	18	107	8¼	
„ March -	1	4	–	–	–	–	–	–	–	–	2	1	1	1	–	–	–	–	1	15	3	3	22	4	–	–	–	–	29	106	9½	
Total for the year	1	43	17	–	–	–	–	5	12	–	9	2	2	32	7	–	5	8	3	77	21	6	171	67	–	1	1	2	244	104*	8†	—

* Average strength. † Average daily sick.

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TABLE showing the NUMBER and RATIO of ADMISSIONS and DEATHS in the several Ranks of the B. Troop Madras Horse Artillery (*including all who have been present with the Troop at any Time during the Year*, excepting Commissioned Officers), under the Classes "Teetotalers," "Temperate," and "Intemperate;" the Diseases being classed as in the preceding Table.

Classes.	Teetotalers.		Temperate.		Intemperate.		Total.	
Strength.	4.		114.		35.		153.	
Classes of Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Fevers	1	—	43	—	17	—	61	—
Eruptive Fevers	—	—	—	—	—	—	—	—
Diseases of the Liver	—	—	5	1	12	1	17	2
Diseases of the Lungs	—	—	9	—	2	—	11	—
Diseases of the Stomach and Bowels.	2	—	32	—	7	—	41	—
Diseases of the Brain	—	—	5	—	8	—	13	—
All other Diseases	3	—	77	—	21	—	101	—
Total	6	—	171	1	67	1	244	2

TABLE showing the NUMBER and NATURE of PUNISHMENTS according to HABITS.

Punishments awarded by	Non-commissioned Officers, Privates, and Musicians.		
	Teetotalers.	Temperate.	Intemperate.
Regimental Captains	1	45	43
Commanding Officers	1	11	52
Regimental Court-martial	—	1	3
District Court-martial	—	1	3
General Court-martial	—	—	—
Total	2	58	101

References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	3. Distilled spirits are sold both at the canteen and bazaar. In the Artillery canteen no man is allowed to have more than 2 drams of spirits per diem, and in the 18th Royal Irish only 1 dram is allowed at present. About one-fourth of the men do not take their allowance. Spirit is no part of the soldier's ration. It is issued on payment at the canteen. The arrack issued to canteens is of the very best description. Each man is allowed to purchase 2 drams a day at 1 anna per dram, or 1 dram of arrack and a quart of malt liquor at 3 annas per quart. The men are not allowed to take a dram before morning parade. From 3 to 6 oz. of good wholesome arrack is given as a ration to convalescents, if deemed necessary by the medical officer. No drinks injurious to health are sold in the canteen, but in the bazaar drinks of various descriptions which are injurious to health and adulterated spirits are vended.
	4. Spirits are conducive to health if taken in moderation, and when requisite. Convalescents only get it by order of the medical officer. The use of spirits as at present, is both detrimental to the efficiency and discipline of a corps.
	5. It would be beneficial to abolish the sale of spirits in canteens, and more particularly by the contractors in the bazaar, who though strictly prohibited from selling it to soldiers, or to parties to be carried away, yet manage to have it sold to soldiers indirectly.
	6. Malt liquors and wine are preferable to spirituous liquor, being more conducive to health and less likely to cause disease.
	7. Tea, coffee, lemonade, &c., are much used, but particularly coffee. As compared with spirits they are most beneficial to health, efficiency, and discipline, but a moderate supply of malt liquor is of advantage to the soldier in this climate.
	8. It would be decidedly advantageous to suppress the spirit ration and substitute for it beer, tea, &c. By spirit ration is meant what the soldier can purchase at the canteen, though but a portion of his ration.
	9. It would certainly be beneficial to permit only beer, tea, coffee, &c., to be sold to the troops.
	10. Our opinions are embodied in the preceding remarks, and we have nothing further to suggest as recommendations.
	11. The sale of all spirituous liquors and intoxicating drugs in the bazaar is under the control of Government, the abkarry contract being let or sold once a year. The regulations are the same at all stations within the Madras Presidency. Those for the prevention of smuggling will be found in Regulation VII. of 1832. All sale of liquor to Europeans is prohibited and prevented as far as possible, but cases sometimes occur in which Europeans by various contrivances manage to obtain liquors through the intervention of natives. These latter when detected are severely punished. The canteen regulations, which are strictly acted up to, are laid down in G. O. C.C., dated 17th August 1855.
VI. DIET.	1. The rations of all European troops are as follows:—Bread 1 lb., meat 1 lb., beef or mutton, rice 4 ozs., sugar 2½ ozs., tea $\frac{5}{7}$ oz., salt 1 oz., vegetables 1 lb.; firewood 3 lbs. The only item which varies is the vegetable ration. As a general rule about 12 ozs. of potatoes and 4 ozs. of onions, green or any other vegetable in season, constitute the ration, but the proportion of potatoes varies according to the season, and the supply in the market. The rations are inspected daily by the orderly officer of the day, and frequently by officers of companies and the commanding officer.
	2. A complete ration includes vegetables, but no fruit. The stoppage is 3 annas 4 pice a day from each man's pay. When rations are not supplied the amount is refunded, and when the actual cost to Government does not come up to the above sum the difference is repaid to the men. They have three meals a day, consisting of tea or coffee, and bread for breakfast, at 8; dinner, beef or mutton, and vegetables, at 1-5, and tea and bread, at 4.30 for the infantry, and 6 or ½ past 6 for the artillery.
	3. The rations are good and sufficient, and there does not appear any change called for. The sale of rations is prohibited, and the mess orderlies, to whom the rations are entrusted, make it their business to see that they are not misappropriated either by the men or the cooks.
	4. There are cook-rooms with raised places for fire attached to the barracks. Native cooks are employed, and the apparatus used is that common to this country, generally large and small copper boilers, iron frying pans, &c. The kitchens are kept clean, but they have not much light and are not freely ventilated. Water is supplied throughout the day as required by puckalies, and is kept in chatties for use. The food is either boiled or roasted, as the men wish, sometimes stewed, and often curried. It is properly done and sufficiently varied, and tea and coffee are properly prepared. On march, if it be a short one, the men have coffee before starting, if a long one, they get it half way.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	5. Gardens could generally be kept up advantageously by Europeans. The men of the Horse Artillery have less time for it than others. In the first instance seeds ought to be given to the men, and the produce of their gardens purchased by the commissariat department for the men's rations as far as may be required. The rest they might sell to the public, a vegetable bazaar being established near the garden or other convenient spot.
VII. Dress, Accoutrements, and Duties.	1. No deviation is allowed at this station from the dress and accoutrements of the soldiers as laid down in the regulations. The cloth clothing in the cold season, and the khakee in the hot weather are well adapted for the climate, and the dress, &c., is suitable for the soldier's duties. The helmet for the Artillery, and the shako for the Infantry in full dress are not adapted for the climate. The article called a turban, worn by both Cavalry and Infantry (Native) is unsightly and most inconvenient. It is strongly recommended that the men, both on hills and in plains, wear flannel shirts or belts, and worsted socks. A light helmet is being introduced in place of the forage cap, which is well adapted for the country. The same of felt, protected with steel plates for active service in the field, would be found advantageous for the Horse Artillery. The guard dress varies according to season; during the hot season the khakee dress, and helmet covered with the same, and in the cold weather, shell jackets or serge tunics, with cloth trousers and forage caps. Great coats are worn during the cold weather when necessary, and during the rains. Sentry boxes or verandahs afford shelter from the sun and rain.
Duties.	1. It would be very advantageous if the men came out from home thoroughly drilled; their being drilled at any intermediate station does not appear to be so. 2. The usual routine of a soldier's duty is drill, parades, roll call, and guard duties. An hour is the duration of the drill. Horse Artillery and cavalry have stables, &c., after this, and stables in the evening. European infantry drill in the morning for an hour, and sometimes the same in the evening. Native infantry the same, but rarely out in the evening except for roll call. The health of the men does not suffer thereby. The best hour for drills, &c., is in the morning immediately after daylight, and in the evenings from half-past 5, to half-past 6, according to the season. For marches, troops ought to start at such time as to ensure the encamping ground by 7 a.m. The Horse Artillery men have about five nights in the week in bed; the European infantry five or six; the native cavalry five; and the native infantry four. 3. Guards are mounted at a convenient distance from the barracks. They last twenty-four hours, each man mounting sentry for two hours at a time, or eight out of the twenty-four. In the Horse Artillery there are four roll calls; one for marching to stables, one for dinner, one at 5 for evening stables, and one at 8 p.m. European infantry, one for breakfast, one for dinner, and one at tattoo, and at any hour for defaulters. The cavalry has no roll call, parades, stables and watering parades answer the purpose. In the native infantry, where there are no parades there are roll calls morning and evening, and at 8 at night if ordered by the commanding officer. The night guards do not apparently affect the health of the men.
VIII. Instruction and Recreation.	1. The means of recreation and instruction at the station consist of a ball court, skittle ground for the Horse Artillery, a garrison library, and Horse Artillery library, the latter lighted till 9 p.m. There are no schools, day rooms, gardens, workshops, theatre, or gymnasia. There is not by any means sufficient occupation for the men in the wet season, or during the heat of the day. The men of the artillery are not restricted as to being out of barracks during the day; but the 18th Royal Irish are forbidden to go out between 10 a.m. and 4 p.m. Being out does not appear to affect health. 2. Topes of trees should be planted at a short distance from the barracks, that the men might amuse themselves under their shade when the sun is hot. A large airy shed, open on all sides, but capable of being secured on the sides from which the land winds and rains come, with a good skittle alley in one part and bars, &c., for gymnastic exercises, would be a great advantage. There ought to be a good plunge bath in the vicinity for the comfort of the men and to teach them to swim. 3. There are Government savings' banks, which are found most beneficial. 4. There are no shaded places for exercise. Trees ought to be planted, not too near the barracks to exclude air. Sheds should be put up also as above stated.
IX. Military Prisons.	1. There is no military prison at this station. The cells are sufficiently large and the ventilation fair.
X. Field Service.	1. There are no local regulations for field medical service. 2. The powers of the medical officers in regard to marches, camping, &c. are limited. 3. Encamping grounds are selected by officers of the quartermaster-general's department. Medical officers should be consulted more than they are on sanitary points connected with them. 4. All arrangements for the guidance of medical officers, whether in cantonment or in the field, are laid down in general orders and the medical code.
XI. Statistics of Sickness and Mortality.	1. No information.
XII. Hospitals.	1. Plans. 2. The hospital adjoins the Horse Artillery barrack, is situated at the south-west angle and surrounded by a wall. The building is about 300 yards from the Horse Artillery stables. The general bazaar is at a considerable distance; being a military station, there is no civil population here. A line of officers' houses run on the opposite side of the road, but the situation of the hospital is open and airy, and the ventilation good. The barracks are near it, but there are no high walls or trees. The site is in all respects unobjectionable. 3. Water is brought to the hospital by puckalies. 4. The impurities are carried away daily by the sweepers to a distance. The surplus water from rain or the men bathing runs into a drain and is carried off by the fall of the ground to the nullah. 5. The building is of one story only. The basement is of stone, in chunam, raised 3 feet from the ground; it is solid and there are no openings for air to penetrate underneath the floors. The roof water runs off into open drains which empty themselves into the main ditch out-

JAULNAH. MADRAS.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	side and is carried to the nullah; the surface drainage is carried off in the same way. The ground on which the building stands is high, and the water is rapidly carried off. The walls are brick, in chunam. Basement, stone in chunam. The roof is of teak wood, couples and collar pieces, and tiled with flat and pan tiles. The roof is not double. The walls are the usual thickness, more is not required, the rooms being lofty and the whole building surrounded by a verandah. There is an open verandah, both in front and rear of the sick ward, 10 feet wide. They afford good shelter, particularly as they have curtains to lower down when necessary. The verandahs at the external end of the building have been enclosed to form rooms for a ward for natives, dispensary, &c. The verandahs are sometimes used for the accommodation of sick and convalescents, but no other parties. The hospital consists of one flat. The following table shows the hospital accommodation.

Total number of wards generally, 2.
Regulation number of beds varies, as shown below.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Man.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
Horse Artillery.		Feet.	Feet.	Feet.	Feet.			Feet.		Feet.	Feet.
Ward No. 1	21	60	21	17	21,420	1,000	60	2½	8	4	3
Ward No. 2, for Natives	4	30	10	11	3,300	825	75	2¾	3	4	3
Native Infantry Hospital.											
Main Ward	19	86	16	14	19,264	1,000	72	2½	7	4	3
Small do.	6	30½	16	14	6,832	1,000	81	2½	3	4	3
9th Regt. N.I. Hospital.											
Two Wards	26	86	16	14	19,264	740	53	2½	6	4	3
	10	30½	16	14	6,832	683	49	2½	3	4	3
2nd Light Cavalry.											
One Room	36	118	16	14	26,412	733⅓	53	2½	8	4	3

Both the hospitals are so placed as to receive the full benefit of the prevailing winds. The windows open inwards and are so arranged and constructed as to be conducive both to ventilation and coolness.

6. Ventilation is carried out by doors, windows, side and ridge ventilators, and are sufficient for the purposes required. There are no jalousies or jhilmils, but there are curtains of gunny in the verandahs.
7. Punkahs and kuskus tatties are used to agitate the air and cool that entering the wards. These things are too well known to require description.
8. There are no means of warming. The hospitals are cleansed and limewashed as often as may be found necessary.
9. A description of the privies, &c., belonging to the Horse Artillery are attached to the plan of the hospital. They are perfectly drained. Any water which is required is brought by the puckallies. The night-soil is invariably carried away, and there are no cesspools. They are as sweet as such places can be. Lime is freely used to purify the floors, &c.
10. There is a small bathing room and tubs supplied, but the conveniences for bathing are defective.
11. The European hospitals have water or bathing rooms, but not sufficiently supplied with conveniences.
12. Dirty hospital clothing is taken away, washed, and brought back by washermen employed by Government for the purpose.
13. The stores are not kept in the hospital, but in a separate building, under the commissariat department. The building attached to the Horse Artillery hospital is used as a female ward, and the stores are kept with the cantonment stores.
14. Iron bedsteads and wooden cots are supplied, the latter laced with coir rope or broad tape. The palliasses are stuffed with straw, and pillows with the same and cotton.
15. The cook-room attached to the Horse Artillery hospital is 15 feet by 10. Along the side facing the door a bank of earth is thrown up about 3 feet high and 2½ broad, and on this bank raised divisions of brick are formed for resting the usual cooking pots and pans over the fire. The smoke escapes through an opening in the roof. The cook-room is within the hospital enclosure, as shown in the plan. The means and native cooks are found sufficient, and the cooking is properly done.
16. Tables appended.
17. The attendance for the troop of Horse Artillery is 1 hospital serjeant, 2 hospital orderlies, 1 first and 1 second class cooly, 1 cornicopoly, 1 tailor, 1 puckaly, 1 cook, 1 toty, 1 sweeper, and 1 female nurse for the sick women and children. Extra orderlies can always be obtained on the medical officer's requisition to attend on bedridden patients.
18. The sanitary condition of the hospitals is good. No epidemic disease has originated in them.
19. We recommend that there should be large surgeries, store-rooms, bath-rooms, and privies, and a building erected in the immediate neighbourhood of the hospitals for the residence of the medical subordinates; that the full complement of medical subordinates should always be kept up as laid down in the regulations of the service, such being seldom the case; and that every hospital should be surrounded by a wall for the purpose of keeping the hospital clear of stragglers.
20. The convalescents take exercise daily when considered necessary, under the charge of a non-commissioned officer. There is no conveyance, no ground fenced off, and no shady walks or seats for their use.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	21. At most stations there is a detached female ward; here there is none, and a small adjoining building to the men's hospital is used for this purpose. 22. No special local hospital regulations exist. 23. The repairs of the hospital buildings must be applied for through the commanding officer. All sanitary measures, diet, medical comforts, &c. are under the entire control of the medical officer. 24. There are no convalescent wards, but such would be advantageous.
XIII. Burial of the Dead.	1. The Protestant burial ground is 3,060 feet from the nearest barrack occupied by Europeans. The Roman Catholic burial ground is situated in the bazaar, and surrounded by native huts. 2. The area of the Protestant ground is 7 acres 1 rood. The principal Roman Catholic one is about 3 acres. The soil of the former on the surface is black soil, then a stratum of grauwacke, and generally, when the bottom of the grave is reached, basalt rock. There is no artificial drainage, but the water runs off from the natural slope of the soil. The Protestant burial ground is carefully kept, but not the Roman Catholic one, or the other native grounds. We have no means of ascertaining how soon decomposition takes place. 3. In the Christian burial grounds the space taken for each grave is about 7 feet by 3, with a space of about 5 feet between the graves. The depth of graves is 5½ feet, and they are never re-opened except on some rare occasions, when a child, for instance, has been buried in the same grave with its parent. There are no regulations regarding the time that must elapse between death and interment. Among the Christian part of the community burial never takes place in less than 12 hours or more than 24 hours after death. The same usage prevails during epidemics. With regard to the burial grounds used by the native troops or camp followers, the graves are about a foot shallower than those of Christians, but about the same length and breadth. The space between is generally less. Each grave contains but one body, and is never re-opened. Many Hindoos, but not all, burn their dead. 4. The graveyards are never offensive, and no precautions are necessary to prevent nuisance. There are no regulations on the subject of burial of British troops, the mode of interment in their case being the same as that in use in Christian communities. 5. The dead of camp followers and bazaar people are disposed of in the same manner as native troops as above stated. 6. No injury to health accrues from the present practice. 7. We can suggest no improvement in the practice now prevailing.

(Signed) W. C. Macleod, Brigadier, Commanding Jaulnah.
Joseph M. Jackson, Surgeon, 2nd Regt. Light Cavalry Senior Surgeon, Jaulnah.
H. H. Foord, Lieut., Executive Engineer, Jaulnah Division.

Jaulnah, 31st May 1860.

POONAMALLEE.

Accommodation { European Troops - Infantry - 600 men.
Native troops - Lines for - 150 ;,

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is an open plain studded with topes of trees, and abounding in paddy fields, and tanks of water here and there for the purpose of irrigation. It is flat, dry, and sandy. There is not much jungle. 2. The station is on a level with the adjacent country, and not more than two feet above the sea level. There are several tanks of water in the cantonment, and the adjacent country abounds in them. There is no higher or healthier ground adjoining the station. 3. There are hills of unknown height about 40 miles distant. 4. The nearest lake is three miles from the station. A great portion of the surrounding country is under water during the monsoon months, between October and January, on account of the very small elevation of the country above the sea level. There is little broken ground near the station; there are no ravines or water-pits. 5. The station is open and freely exposed to the winds. The temperature is not raised by reflected sun heat. It is exposed to variable winds and to land and sea breezes. 6. The country around is cultivated. There are no works of irrigation. Rice is cultivated within the cantonments nearly up to the barracks. Indigo is also cultivated near the station. No injury to health in consequence. 7. There are several small native villages within two miles of the cantonment, but no city or town nearer than Madras, 13 miles distant. 8. (Nature of surface and subsoil not stated.) 9. Water is found at a depth of 12 feet from the surface in the dry season and 4 feet from the surface in the wet season. 10. The rainfall sinks into a pervious subsoil, and so drains off, except when tanks are made to collect it. 11. Water for culinary and drinking purposes is derived from wells. There are several small water-tanks not so used within half a mile distant. These tanks are generally full or half full; there are fish in them. The wells and tanks are not liable to pollution from leaves or other foul matter or drainage falling into them. No tanks for drinking are used for bathing.

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References to Subjects and Queries.	Replies.
I. Topography—*cont.*	The ditch round the fort is a very great nuisance and gives rise to mephitic exhalations during the dry season. It was recommended to be filled up three years ago, but it has not yet been done. 12. The water supply for the station is unlimited in quantity and good in quality, pure and free from smell. It contains alkaline carbonates in small quantities. It is raised and distributed for use by chatties (country earthen pots). 13, 14. (Not replied to).
II. Climate.	1. The meteorological instruments at the station consist of a barometer, thermometer, and pluviometer. 2. The following table gives the monthly means of the years 1855 to 1859:—*

Months.	Barometer.	Mean Maximum.	Mean Minimum.	Rain.	Winds.	
					Direction.	Force.
	Inches.	°	°	Inches.		
January - -	29·670	80·4	74·2	0·090	N. & N.E.	—
February - -	29·705	81·2	76·4	0·120	N.E. & S.	—
March - - -	29·615	82·0	78·0	—	E. & S.E.	—
April - - -	29·540	85·2	80·0	1·156	N.E. & S.E.	—
May - - -	29·470	86·0	80·8	2·532	Variable & S.E.	—
June - - -	29·450	87·2	82·4	2·130	E. & S.E.	—
July - - -	29·395	86·0	82·0	5·096	W. & S.W.	—
August - -	29·445	84·4	81·8	2·950	W. & S.W.	—
September - -	29·470	83·4	79·4	4·506	Variable.	—
October - -	29·465	82·	77·8	11·662	W., E. & S.W.	—
November - - -	29·490	80·4	75·0	13·594	N.E. & S.E.	—
December - -	29·605	81·6	75·6	4·698	N. & N.E.	—

3. The climate generally is considered healthy. Sea breeze daily. Ophthalmia and fevers are prevalent during the hot land winds, and catarrhal affections during the wet cold season, but the health of the troops is little affected thereby. The diet, clothing, and drills are suitable to the climate. The most healthy months are January, February, March, April, and May. The most unhealthy are June, July, August, and September. The prevailing diseases during the unhealthy months are bowel complaints and diseases of the liver; these are, however, generally relapses among sick sent to the station for change on account of those diseases. Very few cases of them originate at the station.
4. There is no district near the station the climate of which is more conducive to health than that of the station.
5. I have served at Trichinopoly, Jackatalla, on the Neilgherry hills, and Poonamallee, but was not long enough on the two former stations to have an opinion as to their healthiness.

III. Sanitary Condition of the Station.

1, 2, 3. Map of station.
4. The following table gives the barrack accommodation. (It is calculated from imperfect data furnished in the return. There appears to be some error in the dimensions as shown by the incredibly small amount of space allowed per man):—
Total number of rooms or huts, 2 long continuous rooms, forming a square.
Total regulation number of non-commissioned officers and men, 600.

Barrack Rooms.	Regulation Number of Men per Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft. in.	Ft. in.	Ft. in.	Ft.			Ft. in.		Ft.	Ft.
1 - -	300	103 9	24 3	13 3	33,637	112	8 6	1 6	71	4	4
1 - -	300	103 9	24 3	13 3	33,637	112	8 6	1 6	71	4	4
Guard Rooms -	10	19 7	15 9	13 3	4,066	406	30 0	1 6	2	4	4
Cells, 4 - -	1	8 0	8 0	7 2	460	460	64 0	—	4	1	1

5. The barrack windows are on opposite sides and open like doors. There is a verandah on one side about seven feet wide, which is frequently used as sleeping quarters, it is said, when the barracks are crowded and the nights hot. There are no jalousies or jhilmils.
6, 7. The bedsteads are wooden cots with cotton web bottoms. When necessary, the ordinary field tents for Europeans are pitched. The number per tent is supposed to be 10 men.
8. The ventilation of barrack-rooms, &c. is imperfect, by small openings in the roofs, and is by no means sufficient to keep the air pure by day and night. Punkahs are allowed occasionally to cool the air. No other means.
9. The barracks are pucka built.
10. The floors are of large square bricks, not raised, but on the same level as the surrounding ground.

* In the table, of which the above is an abstract, the totals of the monthly observations are given, and these have been divided by 5 to give the monthly means.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	11. The present buildings are deemed in every way unsuited for occupation by European troops, and have been condemned accordingly. Repairs are done by the engineer department. Limewashing is done on requisition, and is reported not to have been done for 12 months past. 12. There are two bath-houses, one for men, one for women; also tubs; and at each corner of the barracks there is a stone trough, which is sufficient for all purposes of ablution, supplied from wells; and the tubs filled by puckalies. 13. There are two cook-houses at each end of the barracks; cooks and utensils provided; ample supply of water. No drainage. There are no suitable means of washing or drying linen. 14. The urinals are emptied when required; the privies before daylight each morning, the contents being carried to a distance to a place appointed. 15. The barracks are lighted at night by globe lamps suspended from the roof. 16. There is no sewerage. This subject has been before the authorities. The drainage is certainly not sufficient. The east wing of the barracks is damp, owing to want of drainage. All the fluid refuse soaks into the subsoil where it falls. A foul ditch surrounds the fort, which encloses the hospital. It has been recommended to be filled up over and over again, but no attention has been paid to the subject. 17. The surface cleansing is properly attended to within the cantonment and is efficiently done. The refuse, chiefly decayed leaves and berries, is removed daily, carried to some distance from the cantonment, and then deposited. 18. The surface of the cantonment is covered with short grass, but no weeds or decayed vegetable matter exist. There are no thick hedges, old walls, &c. to interfere with the ventilation of the station. 19. The native huts near the station are dirty and unwholesome as are native huts. The vicinity of the native dwellings contains nuisances, which, when to windward, are detrimental to the occupants of the barracks. To remedy this the natives should be put under the surveillance of a strict sanitary police. 20. Animals for the use of the soldiers are slaughtered at Madras. There is a slaughtering place for the use of the bazaar at a proper distance. The offal is used for manure, and no nuisance therefrom is experienced at the station. 21, 22. There is no stabling here. The halting ground for troops on the march is half a mile from the cantonment, and there the horses are picketed. The ground is dry and clean, and the manure is soon removed by the people. 23. There are no quarters for married men, and the married people occupy barrack-rooms with the men, but separated by tatties.
Officers' Quarters.	1. There are no officers' quarters. Officers doing temporary duty live in private houses or bungalows, which are very scarce and bad. It is suggested that new barracks be built, and that suitable bungalows be built for officers.
IV. Health of the Troops.	1. The district in which the station is situated and the adjoining native population are healthy. 2. The most prevalent diseases among the native population are small-pox and cholera. 3. I attribute the prevalence of the above diseases among native inhabitants to overcrowding and filth. 4. This being a depôt for drafts from England, convalescents, and sick, the garrison is a very mixed one. There is no portion of the men's accommodation unhealthy. 5. The troops at this station are never camped out except when there is want of room in barracks from the arrival of detachments, and that is, generally speaking, only for a short time. No injury to health has followed from men being camped out. 6, 7, 8. Certainly, hill stations are preferable for troops. 9 to 16. No replies. 17. There is no higher ground near this station which could be occupied as a hill station. 18. No reply. 19. The best age for soldiers proceeding to India is 22 years. They should land in the cold season. On landing, troops are placed in barracks with as much attention, room, and accommodation as possible; clothing is supplied, and their drills and duties commence. 20. No reply. 21. Troops proceed to the interior partly by rail, partly by transit. 22. Troops should serve 10 years in India, not more. 23. As regards medical boards, I have personally, and from my experience, no objection to the system now in force regarding invaliding of sick men. 24. The best time for invalids leaving India for home is in May and June, except in certain cases.
Diseases.	1. There are weekly inspections for the discovery of incipient disease. 2. There has never been scorbutic disease at this station. 3. The proportion of cases of hepatic disease usually under treatment is about 1 in 12. Cause attributable to climatic influences chiefly, aggravated in many cases by intemperance. 4. Dracunculus is seldom met with at this station. I have only seen two cases of it in five years. They occurred in sepoys from up-country stations. 5. The proportion of venereal disease to the total sick is small. The best precaution is legalizing prostitution. With a good system of sanitary police, lock hospitals are highly desirable. 6. The zymotic diseases prevalent at this station are chiefly endemic. They are *common, continued,* and *remittent fevers.* Cases of *dysentery* are generally relapses of chronic cases sent to the station for change. *Malignant cholera* has not occurred among the troops since I have had medical charge, upwards of five years, but a few sporadic cases have occurred among the most drunken pensioners.

POONAMALLEE. MADRAS.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	I have never met with any case of *small-pox* among the troops, although the disease is very common among the natives. *Rheumatism*, as met with here, is invariably in a chronic form among the troops, and generally the result of syphilitic disease. The proportion of admissions to hospital from the above diseases to the total admissions is 1 in 5 (20 per cent.), and the proportion of deaths from them is 1 in 3 (33 per cent.) 7, 8, 9, 10. No replies.
V. INTEMPERANCE.	1. There is a good deal of intemperance, the temptation of arrack and women being great. Of late one-third of the garrison has been composed of women. It is sometimes necessary to try men by court-martial upon a charge of habitual drunkenness. 2. Out of the admissions into hospital, 1 in 51 is directly caused by intemperance, and 1 in 124 is the indirect consequence of intemperance. Drunkenness *per se* is punished as an offence. 3. Distilled spirits are sold both at the canteens and bazaars. The quality at the canteen is good, at the bazaar bad. Each man is allowed two drams at the canteen, but can obtain more in the cantonment. Spirits constitute no part of the ration. The old soldiers all take a dram before breakfast. It is greatly to be desired that the young ones should be discouraged from so pernicious a habit. Spirits are not given as a ration to convalescents. Ginger beer is sold in barracks, and the sellers are encouraged to sell it. 4. Spirits in moderation are conducive to health and good order; in excess, destructive to discipline and also to health. 5. It would be beneficial to health to restrict the sale of arrack in the canteen and encourage the sale of beer, and to abolish the sale of all spirits in the bazaar and cantonment. 6. I consider malt liquor in this climate necessary, and am of opinion that it is conducive to health. On the other hand I consider spirituous liquors injurious to health, as they are invariably abused by the men who use them. 7. Tea, coffee, &c. are plentifully used at the station. The influence of tea, coffee, beer, &c. is very beneficial on discipline, as compared with spirits. 8, 9, 10. It would be well for the discipline of the soldier to suppress altogether the sale of spirits, and to substitute beer and porter, and to permit these, with tea, coffee, lemonade, &c., to be sold to the troops. 11. The following are the chief points in the minor canteen rules :— 1. Canteen open from 6 to 8 a.m. to issue tea, coffee, cheroots; again from 12 to 1, to issue liquor for men's dinners, viz., one dram spirits or one pint ale or porter, not to be given to the men till they sit down to dinner. Women may draw one pint malt liquor, as above. 2. Canteen open from 5 p.m., till tattoo, to issue per man one dram of arrack, brandy, or gin, or two drams of wine; or in addition to any one of them, one bottle or quart of malt. If there be no malt, one or two drams of wine. 3. Spirits to be drunk at the bar, but if mixed with two parts water, they may be drunk at the canteen table. 4. No man to give his allowance to another man. There are other disciplinary regulations.
VI. DIET.	1. The ration for European troops consists of bread, meat, tea or coffee, vegetables, (potatoes, onions, pumpkins, &c.). The ration is inspected every morning by an orderly officer, and, if found unwholesome, is condemned by a committee of officers. 2. A complete ration is provided at the rate of three annas, four pice per man. Three meals are issued daily. At 8 a.m., bread, tea, or coffee, and half the daily ration of meat. At 1 p.m., the remainder of meat, either curried, stewed, fried, or in soup, rice, potatoes, &c. At 4 p.m., tea, with eggs or plantains, &c. About one-fourth of the ration consists of vegetables. 3. If the provisions supplied are of the first quality, there is no need of improvement in the ration. The rations cannot well be disposed of by the troops, as in a raw state they are under the charge of a messman and native cooks. 4. The cooking-arrangements consists of a large brick-built room, copper boilers, frying pans, earthenware chatties, &c. The food is either roasted or boiled, at the wish of the soldier. The cooking is sufficiently varied, and tea and coffee are properly prepared. Troops invariably have coffee before the march commences, or half way *en route*. 5. Soldiers' gardens could not be advantageously introduced at Poonamallee at present, as the men are not permanently stationed here, and would feel no pleasure in cultivating that which they may not enjoy.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress consists of tunic and shell jacket, cloth or white trousers, with cap and white cap cover. Khakee clothing, wicker helmet. The dress is suitable to the climate and duties. The cloth clothing is suitable in the rainy season, and the Khakee clothing in the hot season. The guard dress is the same as worn on parade. The guards have their great coats for night, or for wet days, and the guard-room and sentry-boxes to protect them from sun or wet. 2. The duties consist of parades, drills, and guard mounting. Drill three or four days in the week, morning and evening, an hour each time. Men do not appear to suffer in health from drill. The best times for parades and drills are from 5 a.m. to 6 or 7 a.m., and from 5½ p.m. to 6½ p.m. Marches from 1 or 2 a.m. to 6 a.m. The men have three or four nights a week in bed. 3. The furthest guard mounted is 200 yards from barracks. Guards last 24 hours. There are four roll calls by day, none at night. The men do not appear to suffer in health from night guards.

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation.	1. There are ball courts, skittle grounds, and schools. There is a garrison library opened twice a week to issue books. There are no day-rooms, soldiers' gardens, workshops, theatre, or gymnasium. A temporary theatre is occasionally fitted up. There are sufficient means, if the men choose, to employ themselves. The men are returned to barracks from 8 a.m. till 5 p.m. 2. The soldier has his parades and marching-out parade for exercise. There is a fives court and alley. The Commander-in-Chief authorized an outlay from the canteen fund to supply cricket bats and balls. 3. The present system of savings' banks is very advantageous. 4. There is no shade for the men to take exercise, with the exception of a very fine and extensive avenue of trees, which affords a pleasant walk and shade at all times close to the barracks.
IX. Military Prisons.	1. The prison cells are too small and ill ventilated. The arrangement for a water-closet in the cells is objectionable.
X. Field Service.	1, 2. The medical officer may suggest or recommend measures as regards the conduct of the line of march, camping, &c. 3, 4. No replies.
XI. Statistics of Sickness and Mortality.	No returns.
XII. Hospitals.	1. No plan of hospital. 2. The hospital is about 450 yards south-east of the barracks, and to the north-west of the bazaar. It is surrounded by a fort wall, which excludes the air in a great measure; also by a fort ditch of dirty stagnant water, with shelving banks of mud. 3. The wells supply enough of good water. 4. There are, practically, no means of drainage. 5. The buildings are in an oblong square. The floors are on the same level as the ground, and are simply bricked over. There is no provision for carrying away the roof water. There is no regular surface drainage nor guttering. The buildings are one story high, built of brick, single walls and single roofs, tiled. There are verandahs seven feet wide on both sides; they do not afford sufficient protection; they are used by convalescents for walking exercise. The following is the ward accommodation :—

Wards.	Regulation Number of Men per Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area per Bed.	Height of Bed above Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
3	20	63	16	10	10,080	504	50	1½	None.		
1	16	54	16	10	8,640	540	54	1½			
1	8	24	16	10	3,840	480	48	1½			
2	4	15	16	10	2,400	600	60	1½			
		18	16	10	2,880	720	72	1½			

The hospital is not so placed as to receive the full benefit of prevailing winds. It is shut out from the air on all sides by the fort wall which encloses it.
The windows open like doors on hinges; there is no glass.
6. The ventilation is imperfect. There are no jalousies or jhilmils.
7. The air is cooled by punkahs pulled for certain hours of the day.
8. The last time the ceilings and walls were limewashed was 12 months ago.
9. The hospital privies are small puckah buildings, with removable wooden boxes to receive the soil. They require the use of water and lime to keep them from being offensive.
10. The lavatory arrangements are not at all sufficient as to space or appliances.
11. The bathing arrangements consist of hip baths and some basins, but space and means are incomplete.
12. The hospital linen is washed at a distance by paid servants; means adequate.
13. The storage is not sufficient, but dry.
14. The bedsteads are wooden cots, with cotton web supports. Other articles of bedding sufficient.
15. Like all the buildings, the kitchens are much too small. Frying pans, kettles, and iron pots alone are supplied. No kitchen ranges or means of roasting or baking.
16. Diet tables.
17. Provision for attendance on the sick consists of 1 hospital serjeant and 8 native attendants, or one for every 10 sick men. Such attendance is but indifferent and unsuited for European sick. European nursing, in part at least, would be very desirable.
18, 19. The hospital is by no means suited for the treatment of European sick; it is on the ground level; the building is too small, the ventilation imperfect, and sewerage wanting.
20. The provision for exercising convalescents consists of carriage by doolies and sick carts morning and evening, besides walking exercise in a shaded walk.
21. A portion of one of the wings of the hospital is used for accommodating sick wives and children of soldiers, but more cubic space and more accommodation are necessary.
22. In so far as regards the powers of medical officers as to hospitals, the medical officer can suggest or recommend measures; those in authority may disregard such suggestions (this refers to repairs, drainage, room, &c.) The medical officer has full control over the internal economy, and can regulate all diets, and give medical comforts at discretion.
23. There are no convalescent wards, but the necessity for such is apparent.

POONAMALLEE. MADRAS.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1. The British burial ground is 200 yards from the barracks and 400 yards from the hospital. No particular winds blow over it. 2. The ground is 531½ feet long by 240 broad. The subsoil is sandy. No drainage within the walls. 3. The grave space is irregular, as the ground is very large. Depth of graves about 4 feet. Very seldom re-opened. At ordinary times burial takes place from 12 to 24 hours after death. During epidemics 12 hours after death. 4. The grave-yard is never offensive. If a soldier dies in the evening, he is buried the following morning, with the usual military honours according to rank. 5, 6, 7. (Burial of natives.) No replies.

(Signed) John Impett, Colonel-Commandant.
24th May 1860. J. D. Lapsley, Depôt Surgeon.

DOWLAISHWERAM.

Accommodation { Queen's Troops, Sappers and miners. Native Troops, Sappers and miners.

References to Subjects and Queries.	Replies.
I. Topography.	1. The station is situated on a series of low hills, composed of waste sandstone, the surrounding country being comparatively low, flat, and sandy. Towards the river the soil is black, but at a greater distance from it changes to a red sand. It is excessively dry, except where it is flooded by irrigation from the Godavery. To the north and south the country is interspersed with a few small hills. There is no wood or high jungle, nor any great extent of water in the immediate vicinity, but the Godavery flows within 1½ miles of the station. 2. The station is elevated 100 feet above the sea, and about 60 feet above the adjacent country. There is a plateau within half a mile of the station, separated from it by low ground, and of only a few feet greater elevation than the station. It is, however, too limited in extent to be applied to any military purpose. 3. There is no mountainous country within 30 miles, but at this distance there is a hill about 2,500 feet in altitude. About two years ago an attempt was made to establish a small sanitarium there, and by direction of his Excellency the Commander-in-Chief a company of sappers was sent to clear the plateau, but the men were so completely disorganised by fever that the attempt was abandoned. This plateau forms a portion of a range which in the latitude of Vizagapatam rise to a height of 5,000 feet and upwards. 4. The nearest water to the station is the Godavery river about 1½ miles distant. The Samulcottah and Coconada canals are within the same distance. No nullah or marsh exists in the vicinity of Dowlaishweram, nor is the adjacent ground liable to overflow. There is no broken ground from which the water does not speedily drain off. 5. The station is too much exposed to the wind, and does not possess a sufficiency of trees or vegetation of any kind. There is no higher ground or any elevation whatsoever to interfere with a perfect circulation of air through the cantonment. The temperature of the station is not raised by the buildings, being exposed to reflected sun heat, but it is decidedly elevated by the radiation from the sandstone of which the low hills are composed. The station is not exposed to cold and variable winds, but it is to the land winds during May and June, tempered however by the sea breezes in the evening. They have no perceptible effect on health. 6. The country is highly cultivated on the river side, but towards the east there is little or none at all. The Godavery annicut and irrigation works are within 1½ miles of the station, but have no prejudicial effect on health. There is no cultivation of rice, indigo, hemp, or flax in or near the station, but within two or three miles rice is largely cultivated without any restriction. 7. The town of Dowlaishweram is within one mile of the station, and Rajahmundry is four miles distant. 8. The geological structure of the hill on which the station stands is coarse red sandstone, the soil of the surrounding district being alluvial. The station stands on new ground. 9. Water is found during the dry weather from 30 to 60 feet below the surface, and from 20 to 30 feet in the rainy season. 10. The rain-fall and surface water flows off very rapidly. The natural drainage could scarcely be improved. No drainage from any high ground passes into the subsoil of the station. 11. The water supply is obtained for the most part from wells, the drinking water altogether so; water for other purposes being partly procured from the rain-fall. Only one small tank for storing water exists in the station, the surface of which is 12 yards square. This is generally full of water during the greater part of the year (restrictions being placed upon its use), but it is usually dry during May and June. This tank having been recently made is free of vegetation as yet. It is never used for bathing purposes, nor is it liable to pollution from any source; neither has it ever been the cause of nuisance or malaria. 12. The water supply consists principally of that derived from two wells, that from the barrack square well is slightly milky, and has a chalky taste, but smells good. It is a new well. The water, however, is rapidly improving, although at present it is hard, containing lime in excess and some chloride of sodium. The water from the other well is unexceptionably good in every respect. It is soft, clear, and good, and not injurious to health. The amount of water is not sufficient for the wants of the station. It is raised and distributed in the usual way by bheesties and puckallies.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	13. There are no other topographical points bearing on the health of the station to be remarked on. 14. New stations are selected by a committee, comprising the chief military authority, senior surgeon, engineer, and the commissariat officer. I would suggest that in establishing new stations a small body of troops should be first located there for one year by way of testing, beyond possibility of doubt, the salubrity of the site. It has not unfrequently occurred that a site has been selected by a committee, the whole of the buildings sufficient for a large force erected, and when, shortly after the place has been inhabited, it has proved to the last degree unhealthy, and has been consequently abandoned at a heavy cost to Government. In the present imperfect state of sanitary science actual experiment appears the only safe guide in selecting new stations.
II. Climate.	1. There are no means or instruments available at the station for meteorological purposes. 2. There have been no meteorological tables kept until this year. There are no barometers, rain gauges, or wet and dry bulb thermometers supplied to the station, only an ordinary thermometer. 3. The climate here, all things considered, is good for native troops. April, May, and June are very hot, the thermometer reaching 108° in the shade, which, after the opening of the monsoon, is considerably modified. The monsoon lasts from the middle of June till the end of September. October, November, December, January, and February are sensibly colder, especially at night. Except during the monsoon the climate may be called a dry one, not very variable, and free from fog and damp. During the hot season the hot winds blow with violence, tempered in the evening by the sea breeze. The health of the troops is good, and their diet, shelter, and clothing are all suitable, but there might be some advantage in the curtailment of the morning outdoor occupation of the Europeans in the hot weather. The most unhealthy months are just after the commencement of and towards the end of the monsoon, July and September, during which period quotidian and tertian fevers are the prevailing diseases. 4. There is no healthier district near, which is more conducive to health than that in which the station is situated. 5. The following are the stations at which I have served with a statement of their salubrity or insalubrity:—Bangalore, most salubrious; Palghat, not unhealthy; Coimbatore, salubrious; Umballa and Lahore, healthy during the cold season, but fever is prevalent during the hot weather; Simla, most salubrious; Dowlaishweram, healthy for natives, but too hot for Europeans; Wellington, very healthy; Calicut, tolerably healthy; Mulliapooram, unhealthy, much dysentery prevailing amongst Europeans; Oude, all over a most salubrious country: Nagode, unhealthy; Banda is the most unhealthy place, perhaps, in India, and the hottest; Saugor, very fine, but much fever: Kamptee, very hot, much fever and cholera; Rangoon is very hot, but not unhealthy; Pegu, healthy; and Tongoo very healthy.
III. Sanitary Condition of Station.	1, 2, 3. A map of the surrounding country, showing the position of the public buildings, &c., and a plan of the barracks, &c. are transmitted. 4. Table of Barrack accommodation.

Date of construction, 1858.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.				Ft.		Ft. in.	Ft. in.
1 *Barrack Room* - -	50	100	15	17	25,500	510	30	1½	16	5 4	3 10
Married Men's Quarters.											
1 block containing 4 rooms to accommodate 2 married European non-commissioned officers -	2	52	16	17	14,144	7,072	832	1½	10	4 10	3 10
1 do. do. -	2	52	16	17	14,144	7,072	832	1½	10	4 10	3 10
1 do. do. -	2	52	16	17	14,144	7,072	832	1½	10	4 10	3 10
1 block containing 3 rooms to accommodate 1 married staff sergeant -	1	36	16	17	9,792	9,792	576	1½	9	4 10	3 10
1 Do. do. -	1	36	16	17	9,792	9,792	576	1½	9	4 10	3 10
Total - -	58	—	—	—	—	—	—	—	—	—	—
Guard Room - -	10	20	20	18	7,200	720	400	1½	2 3	5 5	2 10 3 0
Prison Cells - -	2	8	8	11	1,408	704	64	—	4	2	3 6

5. The windows are on opposite sides, and open outwards. There is a verandah on both sides extending nearly the whole length behind, but in front broken by the mess room, which is built in, and occupies a portion of the space. I have found, on inquiry, that the verandah was often slept in, but this is a matter of chance, there being ample room in the dormitory, There are also jhilmils painted green, which are well constructed and in good condition.
6. The cots used by the men in barracks are the plain wooden sort, made by placing planks on two trestles, the bedding consisting of one gudrie, a blanket, a sudringee, and a pair of sheets. The bedding, I think, ample, but I should recommend in preference to the cot now in use those made with fine string.

DOWLAISHWERAM. MADRAS.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	7. The tents used in camp for Europeans are 21 feet long by 15 feet broad, each pole being 10 feet 3 inches high. The walls are 5 feet high, and the tents are constructed to hold 20 men. The cubic space for each tent is 2,401 feet, and the superficial area per man 16 square feet. The tents used for natives are two-poled, without walls, 22 feet long by 12 feet broad, the poles 9 feet long, and each tent holds 20 men. The cubic space of each tent is 2,376 feet, and the superficial area per man 10 square feet. 8. The means of ventilation for the barracks seem ample. There are 14 windows, and doors, and a ventilator in the roof above in that occupied by the Europeans. I should think these quite sufficient to keep the air pure by night and day. Punkahs are also used, of the ordinary description, to cool the air of the rooms. 9. The foundations of the barracks are of stone, the superstructure being of brick, the whole laid in mud and plastered externally and internally with lime. The tents are constructed of canvass of the usual description employed in India; and the native huts are built of mud, roofed in with palmyra leaves. 10. The barrack floor is constructed of square stone pavement, raised about 18 inches above the level of the ground, but admits of no passage of air underneath. 11. The materials used in the construction of barracks, huts, and tents are perfectly suited to the climate, and no improvement is required except, perhaps, that the barracks should have been built with mortar instead of mud. The public buildings and cantonments are kept in repair by district engineer, on the requisition of the officer commanding the station, sanctioned by the general of the division. The officer commanding the station is responsible for its sanitary condition. The barracks have not been whitewashed since March 1859, more than a year ago, when the building was first given over to be dwelt in. 12. There is a bath-room close to the barracks for the men, and also a plunge bath for them; but the water for these is very deficient at present. 13. There are no means of cooking provided. It is left entirely to the natives, who are left to their own devices, as elsewhere throughout India. The water is supplied to them by the bheesties in the usual way. There is no drainage to the cooking places. The linen is washed by the native dhobies. 14. There are no drains to the privies and urinals, the refuse being removed daily by native sweepers. 15. These buildings are ventilated by a narrow interstice running the entire length of the building, on both sides of the ridge. They are lighted by common oil lamps at night. 16. There are no artificial drains to the barracks, the natural drainage being so good that water never lies. The drainage is good with regard to getting rid of surface water, but there is no proper drainage for cook-houses and urinals. No part of any of the buildings used as barracks or hospital is damp. The drainage of the barracks not being sufficient the fluid refuse sinks into the subsoil. No cess-pits exist here. There are no foul ditches near the station, but at the distance of a mile there is a canal used for draining the refuse of a sugar factory, from which the foulest effluvia arise. 17. The surface cleansing is performed daily by native sweepers, and the refuse disposed of in any secluded place that may be found. 18. The surface of the cantonment is too sterile to require any precaution to keep it free from vegetation. There are no old walls, thick hedges, &c., to interfere with the proper ventilation of the station. 19. The bazaar is a very small one, and is kept perfectly clean and healthy. It is under the orders of the cutwal and his peons, who are quite sufficient to ensure its being kept in a proper sanitary condition. There are no native houses within a mile of the station, and these present the usual aspect of all native towns, from whence there is always a palpable noxious effluvium. I am not aware of any dung heaps or cess-pits existing within them. The dung of cattle is never allowed to collect, but is invariably carried away for fuel. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. The animals for the soldiers' food are slaughtered about a mile from the station. The only shambles are outside the station, and not subject to any regulations, but no inconvenience is experienced from them. 21, 22. There are no stables or picketing grounds at the station. 23. There are not sufficient quarters for the non-commissioned officers; many are obliged to live in huts, close to the native lines, of a description scarcely fit for Europeans, especially in the hot season.
Officers' Quarters.	1. There are no quarters properly so called. There are only three bungalows, the property of private individuals. These are excellent in every respect, but the officers are put to the greatest discomfort for the want of proper quarters. Many more should be built.
IV. HEALTH OF THE TROOPS.*	1. This query having reference to the healthiness of the native population and the district adjoining the station, admits of two answers; first, as applicable to Europeans; and secondly, as to the natives. The station itself cannot be pronounced unhealthy, but as the occupations of the Europeans require them to be much out of doors, it is not a suitable climate for sappers and miners. The cantonment itself is not unhealthy, but the surrounding district is fruitful of malaria, and the adjoining native population are much subject to fever. 2. The most prevalent diseases are intermittent fever, small-pox, cholera, syphilis to a very great extent, and spleen. 3. Fever amongst the natives is attributable to the large expanse of swampy ground near the river and the canals of irrigation; syphilis to the very defective police and absence of proper sanitary arrangements for its suppression. 4. The troops were at Gallicondah and China previous to coming to this station. No portion of the men's present accommodation is more unhealthy than the rest. 5. The troops are never camped out. 6. I was doing duty with H.M.'s 74th Highlanders at Jackatalla (now Wellington) on the Neilgherries, for nearly a year. My opinion was that that station, with certain exceptions, was equal, if not superior, to any climate I ever experienced in England. The exceptions are in such men as suffer from chronic dysentery and chronic liver complaints; they do not, from the sudden change of temperature, contrasted with the plains, do well at Jackatalla. The change should be gradual.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	7. From my observation, I should say that troops coming from the hills would not be more liable to attacks of disease on returning to the plains. I should say less so, and I found my opinion, firstly, on the thought that men whose constitutions have been braced and nerved in a genial climate would be more impervious to the ordinary influence of contagion, malaria, &c.—more able to resist deleterious causes; secondly, on the experience I have had in marching with troops on two occasions, once to Cannanore and once to Calicut, on both which occasions the men were remarkably well and free from sickness. 8. I strongly approve of selecting hill stations for troops. I think it would be almost equivalent to doubling our army. I imagine a regiment on the hills would be found, from the spirits and health of officers and men, to be almost equal to two regiments on the plains; certainly one and a half. 9. Troops going to hill stations are sometimes liable to be attacked with diarrhœa, the functions of the skin being so suddenly checked; and, as I said before, former cases of dysentery and liver complaint are subject to relapses. 10. The only precautions which occur to me to provide against these attacks are increased clothing, especially flannel, closed houses with fire-places, and plenty of outdoor exercise during the day. 11. From August to May is the best season for residence in hill stations, after which the south-west monsoon sets in with great violence. We have no data on which to found an opinion as to the shortest period of residence which would enable troops to obtain the full benefit of the hill climate. 12. I presume there is no period of residence in hill stations beyond which injury would be likely to be inflicted on the health of troops returning to service in the plains. 13. I am not aware of any special precautions required to be adopted on leaving hill stations for the plains beyond the two previously alluded to. No more than the ordinary precautions were taken that I remember. 14. I should decidedly recommend the location of troops on the hills. As far as my own experience goes, I should say change of stations on the plains is not commendable more frequently than once in four years. Frequent change often ruins officers and men, and by depressing the spirits, injures the health. I am presuming, of course, all stations to be equally healthy. 15. Magnificent barracks are in course of construction at Wellington, and are, I believe, nearly completed. 16. I have no experience to speak with reference to most suitable elevation as sites for hill stations. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. I have found the dark loamy soil, commonly called "cotton soil," unhealthy for stations. In such localities the troops are subject to fever, *e.g.*, Saugor. The red gravelly or sandstone formation seems to me to be the healthiest. 19. The best time of life for a soldier to proceed to India is at 25 years of age, and he should land there between October and March. I cannot speak from experience as to the manner in which troops are disposed of as regards barrack accommodation, &c., on first landing, but I should recommend their being sent so hill stations for a year, as being a more gradual way of acclimatizing them. I would have the recruit depôt on the hills in the Madras Presidency; landing the troops at Calicut, and marching them on by the Sisparra ghat. 20. If troops were sent to the hills, there would be no objection to their being sent from the home depôts to India at once. 21. I cannot speak as to the mode of transport adopted for the conveyance of soldiers from the port to the interior, as I have never marched with fresh landed troops. 22. The number of years a British soldier should serve in India will depend upon how his health has been economised. If as at present he is obliged to serve without intermission in the plains, I should say about ten years was the maximum. 23. With regard to the manner of conducting the business of medical boards, I have never, during my experience, seen any unseemly difference of opinion in reference to invaliding. No suggestion occurs to me on this subject. 24. Invalids should leave India for home rather late in the cold weather so as to reach home in spring or early summer.
Diseases.	1. There are regular inspection parades once a fortnight for the discovery of incipient diseases at this station. 2. There have been no scorbutic diseases among the troops while here. 3. The proportion of cases of hepatic diseases usually under treatment depends on the number of Europeans at head-quarters. The usual cause of the disease is climatic influence, here the cases seen, have been idiopathic amongst fresh landed men. The prophylactic measures suggested are less employment in the sun during the day. 4. Dracunculus is rare. Of the five admissions during the past year all the patients had been on foreign service, and no doubt contracted the malady there, in Bundelcund especially. 5. The proportion of venereal cases to the total admissions into hospital from all other diseases was rather more than one-tenth. In order to prevent the disease medical supervision ought to be held over all bazaars adjacent to troops. The establishment of lock hospitals would be also advantageous. 6. The troops at the station suffer from the following diseases of the epidemic or endemic class:— *Fevers.*—The most frequent form of fever is the intermittent, which is endemic in the surrounding population. *Dysentery.*—Is very rare here. *Cholera.*—Is endemic in the surrounding districts. The camp itself has been singularly exempt, even when the disease has been raging all around.

OWLAISH-WERAM. MADRAS.

References to Subjects and Queries.	Replies.

IV. Health of the Troops—*Diseases—cont.*

Small-pox.—Is not known in the camp, as far as can be ascertained, and not more frequent than ordinary around.

Rheumatism.—Is not frequent. A few cases only of lumbago occasionally occur.

The following is the proportion of admissions and deaths from these diseases to the total admisions and deaths :—

Diseases.	Admissions.	Deaths.
Fevers	½ or 33	2 in 100
Cholera	2 in 300	1 recorded.
Small-pox	None since the corps has been here.	
Dysentery	1/10 of 1	—

7. There are no data on which to answer this query as to the nosological character of zymotic diseases, as none of the class have raged in this station.
8. There have been no epidemics to supply data to show how far the soldiers' habits, on the march or in barracks predispose them to such attacks.
9. There has been no necessity to try quinine at this station as a prophylactic against malarial disease.
10. We have no recommendations to offer on the subject of the prevention or mitigation of malarial disease.

V. INTEMPERANCE.

1. Any of the Europeans who show a disposition to drink are at once remanded to their regiments. The remainder are of necessity temperate. Native sappers from the nature of their work are more inclined to drink than the native soldiers generally, but cases of intemperance are not numerous. There are no confirmed drunkards.
2. The number of Europeans is so limited that sufficient data cannot be obtained to prepare a statistical table of the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station, nor are we sufficiently acquainted with the habits of the natives to enable us to frame one for that portion of the corps. Drunkenness is always punished as an offence.
3. There is no canteen here, but spirits are issued daily by the commissariat clerk. The men take their dram at noon, and it does not seem to have any perceptible effect on health. Spirit is never given to convalescents except in extreme cases.
4. It is doubtful whether the consumption of spirit is conducive or injurious to health, it would depend upon circumstances. It is decidedly conducive to efficiency under heavy and severe privations.
5. We think it would be injurious entirely to abolish the use of spirituous liquors as a ration, but we would strongly recommend its sale being entirely prohibited in the bazaars.
6. Good sound malt liquor is decidedly beneficial to health in India. Spirit as a rule should be avoided.
7. Tea, coffee, lemonade, &c. are not more used than ordinarily. The first two are used by Europeans of all classes here, as well as throughout India, to a very great extent, but we cannot speak as to their influence on health, &c.
8. We are of opinion that malt liquors, if sound, are much preferable as a ration to spirits, but if spirits were altogether suppressed it might occasionally be found very inconvenient.
9. It would be beneficial in the event of prohibiting the sale of spirituous liquors in the canteens to permit only beer, coffee, tea, lemonade, &c. to be sold to the troops.
10. We think the present regulation as regards European soldiers in this country very good.
11. There are no canteen or bazaar regulations at this station.

VI. DIET.

1. The ration for European troops in the Indian army consists of 1 lb. of bread, 1 lb. of meat (mutton twice a week); tea, ⅞oz., or coffee every third day, 1¾ oz.; sugar, 2½ oz.; rice, 4 oz.; vegetables, 1 lb.; salt, 1 oz.; firewood, 3 lbs. The quartermaster examines the rations, &c., and in the event of their being bad, a regimental committee, of which the surgeon is a member, is assembled, who condemn them if they consider them unwholesome.
2. A complete ration is issued each day, the daily stoppage for which is three annas and four pie. Three meals per diem are taken, viz., breakfast at 9 a.m., dinner at 2.30 p.m., and tea at 6 p.m. About one-third of the ration consists of vegetables.
3. There might be greater pains taken at all stations where European troops are located to form vegetable gardens, and to cultivate orange, lime, and mangoe-trees, a thing much neglected. There are no arrangements made for preventing the disposal of the rations by the troops.
4. There are no means or apparatus provided for cooking the food. It is dressed by the native cooks entirely after their own fashion, as it is universally throughout the country. The kitchens are clean, light, and tolerably well ventilated, but are insufficiently supplied with water. The food is both boiled and roasted, and the cooking is properly done and sufficiently varied. No complaints have ever been made on this subject. In reference to whether tea, coffee, or other refreshments are served out on the march, no remark can be made, as no march of troops from head-quarters has taken place for a long time.
5. The establishment of soldiers' gardens under the supervision of a regimental committee would be decidedly advantageous.

VII. DRESS, ACCOUTREMENTS, AND DUTIES.

1. The soldiers' dress at this station consists, in the cooler months of (for natives) a red cloth tunic, blue cloth trousers, black kerchief puggrey, socks, and boots. The accoutrements are,—waist-belt, with sword scabbard, pouch-belt, and pouch and carbine. In the hot months they wear white nugreka's cotton trousers, black kerchief puggrey, and socks, boots, and accoutrements as above. The Europeans wear in the cool months a red cloth tunic, blue cloth trousers, socks, boots, and forage cap. The accoutrements are the same as those for natives, with the exception that they are supplied with a minie rifle

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*cont.*	instead of a carabine. In the hot months they wear khakee, tunic, trousers, and wicker helmet. The dress is suitable both to the climate and the soldiers' duties, and no improvements are required. European guards are never placed in exposed situations when on duty, either by day or night. The natives have their cloaks for wet weather.
Duties.	1. Troops should be thoroughly drilled at home before being sent to India, or else at the depôt if sent to the hills, as drill very much interferes with the men's studies in surveying, architectural course, &c. &c. 2. In the cold weather natives drill every morning for one hour, with the exception of one day besides Sunday in the week, and they work from 8 to 12 and 1 to 5 daily. Europeans are surveying in the morning from 5.30 to 8, and during the mid-day hours are occupied in school, plotting, survey, drawing, &c. &c. The natives benefit greatly by constant and regular work and drill, and are consequently in better spirits and health than regiments of the line generally. The best hours for drill, parades, &c. are from 5 a.m. to not later than 8 a.m. There are general orders on this subject. The men have six nights in bed during the week, but this varies according to the number of companies at head-quarters. The Europeans are seldom placed on guard duties. 3. Guards are mounted at 200 yards distance from the barracks. They are relieved daily at 6 a.m., the sentries being relieved every two hours. There are only two roll calls, viz., on Fridays and Sundays, the days on which there is no drill or work. The men being occupied during the rest of the week renders them uncalled for. Night guards do not apparently affect the soldiers' health.
VIII. Instruction and Recreation.	1. No ball courts, soldiers' clubs, gardens, or theatre; a skittle ground is in course of erection from regimental resources. There is also a library and reading room for Europeans, which is lighted at night. Besides this there are two smiths' and carpenters' workshops, and a brick shed for brick-making, tile-making, and pot-making. This station is very badly off for the means of instruction and recreation. A raquet court is very much needed. No restriction is placedon the men with regard to exposure to the sun and rain when off duty. 2. The construction of a gymnasium and raquet court would greatly improve the existing means of recreation. 3. The establishment of soldiers' savings banks would be very advantageous. 4. There is no shade whatever provided in the shape of trees, sheds, or verandahs to enable the men to take exercise without injury during the day.
IX. Military Prisons.	1. The military prisons are in every respect efficient.
X. Field Service.	1. There are no special field medical regulations in force at this station. 2. The medical officer attached to this committee found during the last campaign every facility and encouragement given by the officers under whom he served to carry out any suggestions made by him concerning choice of ground for encamping, time of marching, rations, &c. but this seems to depend more on the courtesy and good sense of the commanding officer than on any constituted power of the medical officer. Some well-defined rules, bringing the medical officer more *en rapport* with the commanding officer for sanitary purposes would seem advisable, if none have already been issued. 3. The ground for encamping is generally selected by the quartermaster, aided, if necessary, by the medical officer, and this arrangement is generally found to answer well. We have never seen any sanitary regulations published for general information of a camp. Care is always taken as far as we have seen, to pitch a camp on an open, well-ventilated piece of ground, and if possible, on ground not lately encamped upon. The water-supply, of course, depends on the nature of the country, and especially in the neighbourhood of an enemy, may be somewhat precarious. Latrines should always be dug to leeward, and not too far from the camp. The medical officer's powers, as far as we are aware, are not clearly defined, but depend more or less on the courtesy of the commanding officers. It would be better if rules were published defining his authority. 4. Copies of the regulations in force in reference to field hospitals, ambulances, &c., are not at hand, wherewith to supply the necessary information on this subject.
XI. Statistics of Sickness and Mortality.	No information is supplied under this head.
XII. Hospitals.	1, 2. The hospital forms one side of a square, of which the three remaining sides are formed by the non-commissioned officers' quarters, barracks, and store-rooms. It is a great distance, being upwards of a mile from any bazaar or houses of the civil population. The site is open and freely ventilated. There is, however, rising ground in the immediate vicinity, which, though it affords some protection from the hot winds, renders the building damp in the monsoon. A large nullah has been dug to obviate this, but with only questionable success. 3. The water-supply is wholesome, but not abundant. More wells should be dug, and a larger number of bheesties and puckallies employed. 4. Except the nullah alluded to, there is no drainage for the hospital. The surface drainage seems ample, except during the monsoon. Other impurities (as throughout India) are removed daily by toties, and thrown upon the ground some distance from the hospital, whence they are speedily carried away by the natural scavengers of the country. 5. The wards are raised 2 feet above the ground, but do not admit of free perflation of air underneath the floors. The roof-water sinks into the subsoil, or is carried off by the slope of the ground around. There is no artificial drainage, save the nullah alluded to. The hospital is built of brick and stone, with tiled roof, the roof and walls being single. For coolness, a thatched roof is always preferable we think, in this country, but it has the great disadvantage of inflammability. There are verandahs on both sides of the building 13 feet wide, affording ample shelter. These are never used, except as promenades. The hospital consists of one flat only.

OWLAISH-WERAM. MADRAS.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	

TABLE of HOSPITAL ACCOMMODATION.

Date of construction - - - - - - - - 1859
Total number of wards - - - - - - - 3
Total regulation number of beds - - - - Would admit 40 comfortably in all three wards.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Height of Patients' Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.		Number.	Height.	Width.
		Ft.	Ft.	Ft.		Ft.		Ft.	Ft. in.
No. I. Ward -	—	75	20	20	30,000	2	8	5	4 4
No. II. Ward -	None fixed, it has always been far from full.	20	20	20	8,000	2	4	5	4 4
No. III. Ward -	—	20	20	20	8,000	2	4	5	4 4

The hospital is not situated so as quite to receive the full benefit of the prevailing winds, but if it were placed so as to receive the full benefit of the sea breeze, it would be disadvantageously situated with regard to the sun. The windows open by doors; they are provided with jhilmils, and their arrangement and construction is conducive to ventilation and coolness.

6. The means of ventilation in use in the wards are the doors and windows, which can always be kept open in India. The hospital is large, airy, and well-ventilated. The jhilmils are of the ordinary description.
7. No reply to this query.
8. There are *no* means of warming the wards, nor are any needed. The walls and ceilings of wards ought to be whitewashed once a year, and cleaned very frequently.
9. There are no privies properly so called, The Europeans employ commodes in the bath rooms, the natives simply going outside, except when very sick, and then proper appurtenances are found for them.
10. There is a large open bath room, such as is usual in India, for lavatory purposes which is found ample for the necessities of the patients.
11. There are tubs placed in the bath room for bathing the sick. The addition of a shower bath, however, would be found very desirable.
12. The linen is washed by the commissariat department, the means being ample for the requirements of the hospital.
13. There is no storage in the hospital.
14. The cots used in the hospital are iron frames with sacking bottoms laced with cords to the frames, which latter can be doubled up. The bedding is brought by the patients themselves.
15. The hospital kitchen is a small building situated on the western side of the hospital, Cooking is performed by native servants in chatties, and these answer pretty well.
16. Copies of diet tables, diet rolls, &c. are transmitted.
17. The hospital attendance consists of a dresser and hospital havildar, and in case of serious sickness an orderly is told off to any patient who may require one. The attendance is not sufficient. A proper complement of subordinates is one assistant apothecary, and one second dresser to a native regiment, which we never have here, although having in addition to natives some 40 Europeans with their wives and families.
18. The sanitary condition of the hospital is good. No epidemic has yet appeared in the wards.
19. The following deficiencies in the hospital arrangements are pointed out. Sufficient medical subordinates are never obtainable. The number allowed by regulation is an assistant apothecary and in addition to the dresser; the former, however, is never provided.
20. Dooly exercise is the only means of exercising convalescents here, there being no grounds or seats set apart for the sick.
21. There being only a few families of the non-commissioned officers here, these receive attendance in their own quarters. This arrangement is satisfactory.
22. There are no local hospital regulations in force here.
23. The powers of the medical officer are ample as regards the sanitary state of the hospital. Any suggestion made to the commanding officer is as far as my experience goes immediately attended to. The arrangements with regard to diet, medical comforts, &c. are entirely under the medical officer subject to the supervision of the deputy inspector general of the division. These remarks hold good equally on the march.
25. There are no convalescent wards or hospital.

XIII. BURIAL OF THE DEAD.

1. The burial ground is distant from the station quarter of a mile nearly west, the prevailing winds being south-west and north-east. The station is in no way inconvenienced by its vicinity.
2. It has been very lately constructed, and as yet scarcely any interments have taken place within it.
3. The graves, which are to be neatly arranged in order and as near to each other as convenient, are six feet deep, and no monuments are to be erected, the dimensions of which exceed nine feet long, and four and half feet wide. Interments take place at ordinary times within 24 hours, and during epidemics immediately. Natives are buried within 12 hours after death. Their graves are generally from five to six feet deep and three feet broad.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead. —*cont.*	4. The grave yard is never offensive. 5. The dead of camp followers and bazaar people are disposed of in the same manner as native troops. 6. No injury accrues to the public health from the present practice, and no improvement in the way of burial is required.

(Signed) H. T. Rogers, 2nd Captain Engineers, Commanding Dowlaishweram.
M. C. Furnell Assistant Surgeon, D. D. Sappers and Miners.

24th August 1861.

WELLINGTON.

Accommodation { Queen's Troops, Infantry - - 907
Native Troops, Infantry - - 77

References to Subjects and Queries.	Replies.
I. Topography.	1. The Neilgherries rise abruptly from the lower country around them, and are bounded on all sides by short precipitous spurs, the remains of a former great escarpment which, in the course of ages, has been thus broken up by the unceasing action of the numerous streams of water pouring down from their surface. The surrounding country is mountainous. There is a scarcity of wood, few jungles, but an abundance of water. 2. The elevation of the station above the sea is 6,000 feet, and 5,000 feet above the adjacent country. The nearest nullah is the Waterloo stream, which drains the eastern side of Dodabetta, the highest mountain on the Neilgherries. There is no higher and healthier ground adjoining the station. 3. There are several pieces of table land within 9 miles of the station. The highest mountain is Dodabetta, which is 2,000 feet above the level of the station. 4. The nearest water is the Bowani and Moyoar rivers, at the foot of the hills, about 15 miles from the station. The vicinity is not liable to overflow. There are several ravines in the immediate locality of the barracks. There is a constant flow of water, and, although there are trees and other vegetable productions, these are frequently cleared, and no injury to health arises. 5. The station is open and freely exposed to winds. The temperature of the station is not raised by reflected sun heat. The winds are from the land, principally from the N.E. and S.W.; they are not injurious to health. 6. The cultivation of the surrounding country is very sparse, and chiefly consists of stunted barley, wheat, cooralie, and a kind of millet. There are no works of irrigation near the station. No rice or indigo is cultivated on the hills, nor is the preparation of hemp or flax carried on near. 7. There is no city, town, or native population, in the vicinity of the station. 8. According to Mr. H. F. Blankford's geological survey, the rocks constituting the Neilgherry hills belong with a few exceptions to the schistose or foliated class; the other rocks consist of alluvial deposits, a few basaltic dykes, and some veins of quartz. The surface soil and subsoil is a red ferruginous clay, evidently arising from a decomposition of gneiss. The station occupies new ground; the only population ever near the station being about a dozen or two of the hill tribes, who removed beyond the cantonment limits on the formation of the station. 9. There is no well at the station. 10. From the hilly nature of the country, intersected by several valleys, the rain-fall or water from surface springs flows readily away. No drainage from higher ground passes into the subsoil of the station. 11. The water-supply of the station is derived from springs, and is brought into the cantonment by artificial channels. An artificial reservoir for supplying the barracks with water is in course of construction; there are no tanks. The country abounds in all sorts of wild animals, and all European plants, shrubs, flowers, vegetables, and even the oak tree, grow well here. 12, 13. The water-supply is about 9 cubic feet per second, and the quality very good. There is nothing peculiar in its chemical composition; it is soft. Cannot state its microscopic characters; but it is abundant, and not injurious to health. It is to be distributed by pipes from a reservoir, with a head of 70 feet above the lower story of the barracks. There are no other topographical points not included in previous replies. 14. With regard to the amount of inquiry or examination, in the selection of new stations, it is difficult to answer, but I believe this site was selected by the Commander-in-Chief and Quartermaster-General.

ELLINGTON. MADRAS.

References to Subjects and Queries.	Replies.

II. Climate.

1. The mountain barometer and thermometer are in constant use at this station. The other meteorological instruments have been originally supplied for the purpose of observations, but are now entirely useless, from the want of being repaired.
2. Table of Meteorological Observations, from January 1, 1859, to December 31, 1859.

Months.	Barom. Mean.	Mean Temp.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January	24·320	64	64	68	60	S.E.			Frosty.
February	·334	63	63	66	60	S.W.			Little rain, chiefly mornings.
March	·335	67	67	71	63	S.W.			Rain.
April	·400	64	64	67	62	S.E.	Out		Much rain.
May	·335	69	69	73	65	S.E.		Not	Ditto.
June	·344	68	68	73	65	S.W.	of		Monsoon, S.W.
July	·325	67·7	67·7	73·8	62	S.W.		kept.	Ditto.
August	·369	69·55	69·55	74·6	64·5	S.W.	order.		Ditto.
September	·333	62	62	75	59	S.W.			Ditto, S.W.
October	·312	69·35	69·35	74·1	64·6	N.E.			Monsoon, N.E.
November	·307	65·5	65·5	68·2	63·7	N.E.			Ditto, N.E.
December	·332	69·5	69·5	74·5	64·5	S.E.			Frosty.

I cannot answer for the correctness of the barometer, as I fear it is out of order.

3. The climate is excellent and the changes are gradual; but from my experience of nine months, I cannot attribute sickness to this cause. During the first month subsequent to the arrival of the battalion at this station, they suffered much from fever of a low type. This I attribute to the want of drainage in the barrack square at the time. This, however, has been attended to, and the disease has generally disappeared. Where there is no organic disease, the climate is everything that can be desired. The diet is very good, consisting of beef, mutton, and an assortment of vegetables; beef is more frequently issued than mutton, from the difficulty of procuring the latter. The shelter and clothing is as good as could be desired, cloth trousers and tunic are worn in the cold weather and serge in the warm weather. The drill and duties are very light, and there is a gymnasium, skittle ground, and a racquet court; the men also frequently play cricket, and, in fact, everything has been done to employ the leisure hours with regard to healthy amusement. March, April, and May were very unhealthy months at this station; but I do not consider this as a criterion, as, in my opinion, much of the sickness was in consequence of the want of proper drainage, more particularly in the barrack square. This was frequently an immense swamp, and since this essential has been attended to, I cannot assign any disease to the station, nor could I positively state that disease is more prevalent in one month than another.
4. It would be impossible to find a district more conducive to health than that of the station. There are supposed to be three sanitary stations in these hills, viz., Ootacamund, Jackatalla, Coonoor, of which Jackatalla is the convalescent depôt and station for the regiment; the former and latter are principally resorted to by sick officers. The former is the highest station, being 7,416 feet above the level of the sea. Coonoor is 6,000 feet and Jackatalla 6,100 feet above sea-level, and this is certainly the most desirable station at all times.
5. With regard to the stations at which I have served, and their comparative salubrity, I have only been India two years, and served 15 months at Bangalore. This, although a healthy station, could not be compared to this station, and although disease of the liver was very common at that station, still I do not consider it unhealthy, and certainly not injurious.

III. Sanitary Condition of Station.

1, 2, 3. A map of the adjacent country, with tracings of the ground plan of the station and barracks forwarded.

4. Table of Barrack Accommodation.

Date of construction, commenced on the 18th June 1852. Total number of rooms or huts, 16 at present, 20 when completed.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
Lower Story. Rooms:		Ft.	Ft. In.	Ft. In.	Ft.			Ft. In.		Ft. In.	Ft. In.
Barracks for Men - 10	42	129	21 0	15 0	406,350	967 21/42	64 21/42	1 3	3	7 0	5 6
Enclosed Back Verandahs - 5	42	260	12 0	15 0	234,000	557 6/42	37 6/42	—	9	7 0	5 6
Upper Story.											
Barrack Rooms - 10	42	129	21 6	20 0	554,700	1,320 30/42	66 3/84	1 3	3	7 0	5 6
									7	2 6	3 0 ventilators.
Back Verandahs, enclosed - 5	42	260	12 0	13 0	202,800	482 18/21	37 6/42	—	12	7 0	5 6
For Serjeants - 20	1	24	9 6	15 0	68,400	3,420	228	1 3	30	7 0	5 6 Lower Story.
Ditto ditto - 20	1	24	10 0	20 0	96,000	4,800	240	1 3	30	7 0	5 6 Upper Story.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimension of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
Quarters for Staff Serjeants - - 16	—	14½	21 3	20 0	98,600	—	—	—	29	6 6	4 10
Ditto ditto - 16	—	14½	21 3	13 0	64,090	—	—	—			
Hospital Wards for Men - - - 4	—	71½	21 0	22 6	135,135	—	—	1 3	18	4 0	5 0
Enclosed Verandahs to ditto - - 2	—	143	10 0	11 0	31,460	—	—	—	16	4 0	5 0
Special Ward for Men, ditto - - 1	—	33	10 0	19 0	6,270	—	—	1 3	2	4 0	5 0
Female Ward - - 1	—	27½	21 0	22 6	12,993	—	—	1 3	2	4 0	5 0
Enclosed Verandah to ditto - - 1	—	26	10 0	11 0	2,860	—	—	—	1	4 0	5 0
Nurses' Quarters - 2	—	21	12 0	22 6	11,340	—	—	1 3	2	4 0	5 0
Enclosed Verandah to ditto - - 1	—	26	10 0	11 0	2,860	—	—	—	1	4 0	5 0
Serjeants' Quarters - 2	—	21	13 0	22 6	12,285	—	—	1 3	2	4 0	5 0
Ditto ditto - 2	—	10	13 0	11 0	2,860	—	—	1 3	2	4 0	5 0
Apothecary's Rooms 2	2	21	12 0	22 6	11,340	2,825	63	1 3	2	4 0	5 0
Ditto ditto - 2	1	10	10 0	11 0	2,200	1,100	50	—	2	3 0	2 6
Enclosed Verandah - 1	—	26	10 0	11 0	2,860	—	—	—	1	4 0	5 0
Married Men's Quarters - - - 60	—	16	14 0	14 0	188,160	—	—	—	60	4 6	5 6 Lower Story.
Ditto, Back Rooms 60	—	16	10 0	14 0	134,400	—	—	—	60	4 6	5 6 Lower Story.
Ditto ditto - 60	—	16⅓	14 4	16 6	231,783	—	—	—	60	4 6	5 6 Upper Story.
Ditto ditto - 60	—	16⅓	10 4	9 6	96,203	—	—	—	60	4 6	5 6 Upper Story.
Guard-room. Regimental Guard-room.	1	50½	21 0	15 0	15,907½	—	—	—	—	—	—
Guard-room. Defaulter's Room.	1	35	12 3	15 0	6,431¼	—	—	—	—	—	—
Guard-room. Military Prison.	1	24	11 6	11 0	3,036	—	—	1 3	2	4 0	5 0
Guard-room. Hospital Guard-room.	1	16	12 0	12 0	2,304	—	—	1 3	1	4 0	5 0
Prison Cells. Regimental Cells 3	1	13	6 0	15 0	3,510	1,170	78	—	—	—	—
Prison Cells. Ditto ditto 2	1	13	5 3	15 0	2,047½	1,023¼	—	—	—	—	—
Prison Cells. Military Prison Cells - - 18	1	11½	8 0	11 0	18,216	1,012	92	1 3	18	3 0	2 0
Prison Cells. Imprisonment Room - - 1	—	24	11 6	11 0	3,036	—	—	1 3	2	4 0	5 0 Not completed.
Prison Cells. Hospital Guard-room Cell - 1	1	12	8 0	12 0	1,152	—	—	1 3	1	3 0	2 0

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows and doors open into the verandahs on the inside of the quadrangle. The doorways lead from the main rooms into the back verandahs, which are enclosed, and furnished with windows. All doors and windows open inwards. There is an open verandah on one side and a closed dining verandah on the other, 12 feet wide, 354 feet 6 inches long, and 16 feet high. The enclosed verandahs are used as mess rooms, but not as a sleeping apartment. All doors and windows are glazed, the climate requiring it.
	6. In barracks the bedsteads consist of planks and wooden tressels; iron cots are better. In the hospital tape cots or charpoys are used.
	7. No reply to this query.
	8. Ventilating windows are supplied to all the main barrack and hospital rooms, with ventilators 6 inches by 6 inches, provided with tin gratings just above the flooring lines. The guard rooms are ventilated in the same manner. The ventilation is quite sufficient and well arranged. These barracks require warming, but not cooling. Fire-places are provided everywhere, and there are two in each principal room.
	9. The walls of the barracks are built of brick and mortar, plastered inside and out. The roof is constructed of teakwood trusses, and covered with flat and pan tiles. The verandahs are terraced.
	10. The flooring is of granite, asphalte, and akwood. The floors are raised 1 foot 6 inches above the level of the ground, and a free current of air is constantly passing beneath.
	11. The materials used in the construction of the barracks are suitable for the climate. The barracks and cantonments are kept in repair by the Engineers. The Officer commanding the station is responsible for the general sanitary state of the cantonment. The walls and ceiling of the barracks are cleansed and limewashed once in 12 months.
	12. A plunge bath 70 feet by 20 by 6, is built close to the barracks, with water flowing continually through it; it can be emptied and cleaned at pleasure.

WELLINGTON. MADRAS.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	13. Plan of the cook room forwarded. A project for the drainage of the cook room is under consideration. The washing is all performed by native dhobies in a running stream.
	14. A sketch of the privies and urinals is forwarded.
	A project for the general sewerage of the station has been forwarded to Government for sanction. Sewers are to be flushed twice or more frequently daily. The water supply is ample for this purpose.
	15. The ventilation of these buildings is ample. The barracks are lighted by oil lamps burning in glass globes.
	16. Projects for the system of sewerage by pipes have been submitted to Government for sanction. A masonry drainage service for conveying away readily and efficiently all surface water, and drainage is being constructed. No part of the barracks or hospital is damp. As a temporary measure the whole of the night soil and refuse from the barracks is conveyed in covered carts twice daily to cesspits situated about a mile from the barracks outside the cantonments. There is no well or water near the cesspits. There are no foul ditches. The cesspits are the only nuisance.
	17. An estimate for the monthly cost of keeping up an establishment for cleansing the surface of the cantonment has been forwarded to Government.
	18. The surface of the cantonment is kept free from vegetation. There are no old walls, thick hedges, &c. interfering with the ventilation of the station.
	19. The bazaar is well situated and well drained. The water-supply is plentiful. Sweepers are employed in the bazaar for preserving cleanliness. An estimate has been sent in for scavenger carts. The houses being as yet few, it is clear and healthy. The native houses are generally in good condition and free from dung heaps. No nuisance is experienced in barracks from wind blowing over the native dwellings.
	20. There are no fixed slaughter-houses, the site varies yearly as different individuals have the contract. No nuisance is experienced from them.
	21, 22. No reply to these queries.
	23. The quarters for married non-commissioned officers and men are ample.
Officers' Quarters.	1. There are no officers' quarters. Quarters should be built for officers consisting of separate bungalows.
IV. HEALTH OF THE TROOPS.	1, 2. The station is very healthy, and also the district generally, and the adjoining native population suffer very little from sickness, except upon their first arrival from the low country, when they suffer much from intermittent fever and spleen disease, caused by their sleeping on the ground; those who sleep on charpoys are not affected. The burghers and todas, the hill tribes, are generally very healthy.
	3. The healthiness of the native population is attributable to their rude way of living and general abstemiousness.
	4. The troops were at Bangalore nearly 15 months before coming to the present station, and left in March 1859. They were generally healthy; but disease of the liver was prevalent. The battalion also suffered much from venereal disease, and a few cases of cholera. A detachment of over 300 men was quartered at Bellary, and they generally suffered from intermittent fever and venereal, most of whom are even now constant attendants at hospital. In consequence of transit being furnished in removing the men and the daily use of quinine no sickness recurred. The whole of the battalion arrived here about the end of March, soon after which much fever occurred; but latterly it has been very healthy, and it would be difficult to specify any particular disease, except admissions from syphilis consecutiva. No portion of the men's present accommodation is more unhealthy than the rest.
	5. Troops are not camped out, nor would it be desirable, as the station is too cold.
	6. This is the first time I have been in charge of troops at a hill station, but from my short experience and observations I think hill stations very desirable for men not subject to organic disease. Hepatitis, splenitis, rheumatism, morbus cordis, dysentery, and diarrhœa, phthisis p.t., and syphilis cons., all deteriorate. Convalescents from fever, and men in a weakly state without organic disease, gain flesh and strength rapidly.
	7. No experience as to whether troops resident for some time on hill stations are more or less subject to febrile or other diseases on returning to the plains, but should think it would certainly diminish the liability to such attacks.
	8. I approve of selecting hill stations for troops, and would strongly recommend the adoption of such a plan whenever practicable, by sending troops to such stations immediately on their arrival in this country.
	9. No knowledge of any diseases peculiar to hill stations with which troops are liable to be attacked on going to them.
	10. There are no precautions particularly necessary. Cap covers are always worn during the heat of the day. February and March are very hot, and the sun very powerful between the hours of 9 a.m. and 4 p.m.
	11. The hot months in the low country are always chosen by those who are able to procure leave. One season is as good as another in the hills for regiments stationed for any length of time, precaution of course being taken not to remove troops in the monsoon. To obtain full benefit to their health, troops should reside in the hill stations for a period of not less than two or three years; the latter is to be preferred.
	12. There is no period of residence in the hill stations likely to inflict injury on troops returning to the plains.
	13. The precautions necessary for troops leaving hill stations for the plain are the same as those adopted on being quartered at a hot station; I think it would be advisable to administer quinine daily for ten days or a fortnight.
	14. To preserve the health of troops, I should prefer locating them for a short period on the plains, alternated with short periods of service on hill stations. Troops should not

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	be changed too frequently. European regiments are always quartered in large cantonments, and I do not think the men's spirits suffer in the plains. It would be advisable, in case of an epidemic occurring, to remove a regiment as soon as possible. 15. Nothing appears to have been omitted in the barrack and hospital accommodation at this hill-station. 16. No experience to show at what range of elevation above the level of the sea are the most suitable sites for hill stations. Jackatalla is 6,100 feet above the sea-level. 17. There are two places near this station well suited for hill stations:—Ootacamund, about nine miles distant in a north-westerly direction,—it is 7,416 feet above the level of the sea, and easy of access: still I do not think it is desirable, as it is much colder. Kotagerry, about 10 miles off in an easterly direction, is quite as well suited for a hill station; but it would be necessary that it should be limited, as wood and water are scarce. Its elevation is 6,571 feet above the level of the sea. 18. No experience as to the class of surface and subsoil healthiest for stations, but I should think a gravelly soil would at all times be desirable. 19. Soldiers should proceed to India before the age of 20, and should land there in the months of November and December. With regard to the disposal of troops on landing, it is difficult to answer; upon my arrival, the only accommodation available in Madras was the Governor's banqueting hall, where the head-quarters, numbering nearly 500, remained two days, and then marched to the depôt at Poonamallee, about 11 miles; the march was completed by seven o'clock in the morning. The men landed in thick quilted white cap covers, serge trousers, and cloth tunics, but little duty was required of them. I think every precaution is taken to preserve the health of recruits, the men not being allowed to roam about in the heat of the day. When on duty they either walk about under covered verandahs, or stand in sentry boxes, well protected from the sun. 20. It would be desirable to send troops to an intermediate station, either St. Helena, or better perhaps to the Cape, as there they would be available to garrison the colony, without keeping up a large local force. When practicable, it would be desirable to send troops on landing to hill stations, and I think in a short time it could easily be accomplished, as the railroads will pass within a very short distance of them. 21. Within the last few years, the troops have been sent from one station to another, when practicable, in transits, and this appears to be the general desire of the Government. Much sickness is thus avoided, more particularly cholera. Troops are marched when other modes of transit are not available. 22. The number of years a British soldier should serve in India must depend upon circumstances. When disease of a severe nature has attacked a soldier, the sooner he is removed the better; but with care and attention, arriving young, regularity of diet, and a good constitution, and being thoroughly acclimatized, many soldiers, after 20 years' service, are not more broken down than after serving in the colonies. 23. In many instances I have observed conflict of opinion as regards invaliding, in the mode of conducting the business of medical boards; for instance, a local board assembles to decide whether it is necessary to send men before a general invaliding committee, and frequently were it not for the intervention of the Deputy Inspector-General of H. M.'s hospitals, men would be retained, after being considered fit subjects for removal to England by the regimental surgeon; this is, in my opinion, in consequence of the two services being separated. A depôt at the Cape for Indian invalids would be very desirable. A short sojourn at this station would in many cases so recruit a man as to render him fit for garrison duty, and he would consequently rejoin his corps in a far less space of time. 24. In most instances no particular time should be fixed for the departure of invalids for home; this should be left to the local medical authorities. Men suffering from phthisis pulmonalis or rheumatism should not leave so as to arrive in the cold season, proving the advantage of the Cape as a convalescent depôt. I would not scruple to remove men to this station at any time.
Diseases.	1. There are regular inspection parades for the discovery of incipient diseases every Saturday morning, the time being fixed by the Commanding Officer. 2. A few cases of scorbutus have occurred, but they are not attributable to the station. By my recommendation the whole battalion have an allowance of lime juice the first month in every quarter, and much benefit results from this. The few cases of scurvy that have occurred were principally amongst men of broken down constitution from syphilis, and in the form of scorbuto-syphilitic ulcers; change to a warmer station was always had recourse to. 3. Since the battalion has arrived at this station few fresh cases of hepatic diseases have occurred; those that have taken place may be attributed to too free indulgence in stimulants. In the low country the sudden transition from a temperate to a warm climate must be looked upon as the general cause. The disease has not been frequent in the battalion, and I cannot recommend any prophylactic measures which would diminish its frequency. 4. No cases of dracunculus have occurred at this station, or at Bangalore, and from inquiries I am inclined to think it is very uncommon among Europeans in this Presidency. It is supposed to be endemic at Matunga near Bombay. 5. The proportion of venereal diseases to the total sick in hospital has been 57 per cent. Since the formation of the battalion in 1855 this disease has been quite a scourge, first at the Curragh camp, then in Dublin, and upon its arrival at Bangalore; the per-centage since December 1857 has been 49½. This may be accounted for by the youth of the men, among which class it is more common than among old soldiers, the latter finding more pleasure in intemperance. I think a good plan to check this disease would be to stop the pay during the time they were under treatment, or to increase the hospital stoppages; most certainly lock hospitals would be very advantageous under the control of Government, and would, in a great measure, lessen this disease among the troops. Even

Wellington. Madras.	References to Subjects and Queries.	Replies.
	IV. Health of the Troops —*Diseases—cont.*	supposing this were an expensive measure, still in the long run, it would be a great saving, as more men are rendered useless and eventually invalided from this disease than any other. 6. Neither epidemic nor endemic diseases have been found to occur in this battalion either at Bangalore or at this station. *Fevers.*—Remittent fever was very common during the months of March, April, May, and June. This was in consequence of want of drainage, but since this essential has been attended to, the disease is not frequent. This form of fever appears to be the most common at almost every station. *Dysentery.*—Some cases have been under treatment, but this disease has not appeared as an epidemic. *Cholera* is not known at this station, neither amongst the natives nor Europeans. One case was under treatment since the battalion arrived, but its origin was traced to the low country, premonitory symptoms having appeared on the line of march. *Small-pox.*—No case has occurred among the troops at this station. Vaccination has been carefully attended to. Government vaccinators are employed in visiting every station for the purpose of performing the operation on the natives. *Rheumatism* is not common; few cases have been under treatment, they are very unmanageable at this station, and generally require removal to a warmer place. The proportion of admissions and deaths from these diseases to the total of admissions and deaths is as follows:—Fevers, admissions, 12 per cent.; deaths, 38 per cent. The per-centage appears very great; the reason has been already stated, and since the cause has been removed the disease is very rare and seldom fatal. Admissions from dysentery, 2¼ per cent.; deaths, none. Cholera, 0·14 per cent. admissions; deaths, 7 per cent. No deaths from this disease have occurred at this station, they occurred in the detachment at Bellary, but during the year. Admissions from rheumatism, 4½ per cent.; no deaths. No case of small-pox has occurred. 7. No experience of the character of the zymotic diseases, none having attacked the battalion. No season has been marked as favouring these diseases at this station. No knowledge of the climate and atmospheric conditions which precede or accompany their appearance. Every precaution is taken in the immediate vicinity of the station to prevent any accumulation of refuse or decomposed vegetable substances. I believe zymotic diseases are unknown amongst the natives at this station; at the present time it is not thickly populated. I have visited the native bazaar on more than one occasion, and cannot say that I discovered any disagreeable effluvia arising therefrom. The natives residing in the vicinity of the station appear generally healthy, and I am not aware they are subject to disease. 8. Epidemic disease has hitherto been unknown in this station: the duties are very light, the barracks are well ventilated, and the men have had no marches or exposure on the field. 9, 10. Quinine has been used in small quantities when the battalion or a detachment has been removed from one station to another by transit, to prevent disease. My experience in treating material disease would induce me to give large doses of quinine. No recommendations to suggest.
	V. Intemperance.	1. The soldiers at the station are temperate; there are very few confirmed drunkards, the proportion being 1½ per cent. 2. There has been no admission into hospital directly or indirectly from diseases caused by intemperance during the year. Drunkenness is always punished as an offence. 3. Distilled spirits are sold in the canteen, and also in the bazaar under police regulations to natives only. The quality of the canteen liquor is good, and the consumption by each man per diem is on an average $\frac{8}{9}$ths of a dram of spirits, and rather less than one pint of malt liquor. Spirit is no part of the ration for soldiers either at the station, on march, or in the field. It is not procurable until the afternoon. It is not given as a ration to convalescents; but when considered necessary by the medical officer, a man receives a pint of porter or ale. No deleterious drinks other than intoxicating drinks are sold in the canteen or bazaar. 4. The consumption of spirits is decidedly not conducive to health, but it would depend on the quantity taken whether they caused an injurious effect. The quantity permitted does not affect efficiency or discipline. 5. The battalion has not suffered in health from intemperance. The men generally prefer beer or porter from the canteen to spirits. The police restrictions are very stringent with regard to the sale of liquor in the bazaar. 6. Malt liquor is preferable in every respect to spirits. The beer issued from the canteen contains a due proportion of hops, is English, and not too strong. I therefore look upon it as a tonic. Wine, unless procured direct from the Cape, would be too expensive for the men to drink, and when a cheap wine is sold, it is generally sour, producing heartburn and general indigestion. Spirits are stimulating and not nutritious, and taken without water, which is the general practice with the soldiers, must necessarily be injurious. Prescribed under the guidance of medical men to the sick, they are of much service. 7. Coffee, tea, and ginger beer are much used at the station. Coffee, tea, &c. are quite sufficient for persons in a good state of health; but in a relaxing climate, a moderate quantity of wine or malt liquor should be taken. 8. Beer or porter are preferable in all respects to spirits, and are beneficial both to the healthy and convalescent soldier, when taken in moderation. Tea and coffee are proper beverages with the morning and evening meals. Coffee is also a very proper beverage for troops when marching.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	9. It would be very desirable to prohibit the sale of spirituous liquors in the canteens, and to permit only tea, coffee, beer, lemonade, &c., to be sold to the troops, if it could always be put in practice. 10. I think that if the Government was to contract with the wine growers at the Cape, light wines might be supplied to the troops at a very moderate rate, and I am inclined to believe that wine and malt liquor being constantly kept in a regimental canteen, they would satisfy the desires of every soldier, and eventually cause them to forsake spirits. 11. Memorandum of the canteen regulations:— "The regimental canteen is open daily for the issue of liquors to the men of the battalion at the following hours: "From 2 till 3 p.m., arrack, 1 dram per man. "From 5.30 till 6.30 p.m., porter or beer, 1 pint per man. "From 6.30 till 7.45 p.m., arrack, 1 dram per man. "Note.—The soldiers of the battalion are permitted 1 pint of porter or beer per man with their dinners." The bazaar regulations are that no intoxicating liquor is to be sold either to European soldiers or women.
VI. Diet.	1. The ration for Queen's troops and European troops in the Indian army is the same, and consists of 1 lb. of beef per diem, 5 days in the week, and 2 days mutton, 1 lb. bread, 4 oz. rice, 12 oz. potatoes, 4 oz. vegetables, $\frac{5}{7}$ oz. tea, $2\frac{1}{2}$ oz. sugar, 1 oz. salt, 3 lbs. firewood. The rations are inspected daily by the Quartermaster of the regiment, the Orderly Officer, and at uncertain periods by the Commissariat Officer. A complete ration is provided as above, but no fruit. The stoppage is five annas per diem. The soldiers have 3 meals daily, viz., at 8 a.m., 1 p.m., and 4 p.m. The proportion of vegetables entering into the constitution of the ration is 12 oz. potatoes and 4 oz. of cabbage, turnips, carrots, &c. 3. Mutton should be provided more frequently, and I would recommend that once a week salt meat and dried peas should be issued. A corporal is detailed daily from each company to superintend the cooking. 4. The means and apparatus for cooking available at the station, are copper kettles, tinned when required, open fire-places, and 3 lbs. of wood for fuel per man. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. The food is boiled, fried, or baked, but never roasted. The cooking is properly done and sufficiently varied. Coffee is provided before a march. 5. Gardens for the cultivation of vegetables by soldiers could be advantageously established near the station. A certain portion of ground should be allotted to each company, and seeds and tools provided by Government.
VII. Dress, Accoutrements, and Duties.	1. The soldiers' dress and accoutrements are the same as in England with the addition of cap covers and a serge frock in lieu of the shell jacket. The dress is suitable to the climate, and for soldiers' duties by day and night, and at different seasons. I consider the present dress worn in this country well adapted for the purpose required. The guard dress is the same as in England, with white cap cover, great coats and sentry boxes as protection from the wet.
Duties.	1. Soldiers should be thoroughly drilled at home before coming to India. 2. The routine of a soldier's duties is parade at 6 a.m., drill at 6 a.m. and 4.30 p.m., lasting 1 hour at each time. The men of the battalion have never suffered from drill or any other duty they have had to perform. The best hour for drill is dependent on the season, so as to avoid sun and rain. There are no general orders respecting these, excepting those in paras. 6 and 7, p. 152 of General Regulations of the Madras Army. The men average rather more than 6 nights in bed. 3. The greatest distance from the barracks at which guards are mounted is $1\frac{1}{4}$ miles, they are relieved every 24 hours. The night guards have never affected the battalion; they are very light, and every man on night duty wears his great coat from 12 o'clock midnight till sunrise. There are frequent roll calls by day, and check roll calls at uncertain hours by night.
VIII. Instruction and Recreation.	1, 2. The means of recreation and instruction are as follow: there is one ball or racquet-court, four skittle-grounds, and a regimental school. A library and reading-room are in course of construction. There is one coffee-room, and a soldiers' garden is in course of formation. There are none but regimental workshops; but there is, however, a theatre and gymnasia. They are sufficient to keep the men occupied during the wet season and the heat of the day. The men are not allowed to go out of the barracks, during the heat of the day without cap covers, nor are they allowed unnecessarily to expose themselves to the rain. No improvements to suggest. 3. A Government Savings' Bank already exists, which is of great advantage to the soldiers. 4. There is sufficient shade from trees, &c., to enable the men to take exercise without injury to health, during the day.
IX. Military Prisons.	1. A military prison is in course of construction.
X. Field Service.	1. Copies of Marching Instructions forwarded. See Appendix. 2. With regard to the powers of medical officers, as to the conduct of the line of march of troops, &c., the only march I have made with the battalion was upon first landing in December 1857; this was 11 miles from Madras to Poonamallee; the officer in command attended to every recommendation in a sanitary point of view. 3. My experience has not been sufficient to state how far the Commanding Officer would attend to the regulations contained in the Marching Instructions, for the preservation of the health of troops, as to the selection of camping grounds, &c. It would be my duty to point them out, and to report any deviation to higher authority.

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References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	4. Every facility is granted for field hospitals, and the transport of sick, &c., and every precaution taken. The hospital establishment is provided by the Commissariat department, which in the line of march is under the superintendence of a purveyor, who is under the orders of the medical man in charge. Doolies and sick carts in a fair proportion are allowed, sufficient to answer all purposes; but in cases of emergency, these could be provided, through the Hospital Purveyor, if necessary, even when marching. Hospital supplies are carried by Coolies, and are always in immediate readiness for use. Hospital diets are the same as if the battalion was in quarters. Hospital servants march with the column.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.
XII. HOSPITALS.	1, 2. A ground plan and sketch of the hospital is transmitted. The site of the hospital is open, and there are no buildings, high walls, &c., to interfere with the ventilation. It is generally healthy as to ventilation, drainage, absence of malaria, foul ground, or other nuisances. 3. The water is supplied by pipes, and is plentiful and good. 4. The hospital is situated on a spur of the barrack plateau hill, and is well drained. The sewage is emptied into the Waterloo stream, at a distance of 600 yards from the privies attached to the buildings. The sewers are flushed several times daily. 5. There is free ventilation below the floors of the wards. Drains are provided for carrying away the roof water. The drainage is quite sufficient to carry away the rain-fall rapidly. The hospital is built of bricks and mortar; on the inside of the building there is an enclosed verandah, 12 feet wide; and on the outer side they are protected by an open verandah of the same width. They afford sufficient shelter from the sun's rays. Each ward is provided with two fire-places. The verandahs are compelled to be used occasionally for the accommodation of sick, convalescents, or others, in consequence of their being no special ward. The building consists of one story. TABLE of Hospital Accommodation. The date of construction is the same as the barracks. There are 10 large wards, and the total regulation number of beds is 22 in each ward.

Wards or Hospital Huts, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Bed.	Height of Patients' Bed above the Floor.	Windows. Number.	Height.	Width.
		Ft. In.	Ft.	Ft.				Ft. In.			
4 Wards	22	79 6	21	20	33,390	1,513 4/22	75 12/22	1 3	5	5	4
	22	79 0	21	20	33,180	1,508 4/22	75 9/22	1 3	5	5	4
	22	60 0	21	20	25,200	1,145 14/22	57 6/22	1 3	4	5	4
	22	68 0	21	20	28,560	1,297 4/22	64 20/22	1 3	4	5	4
Special Ward - 1	—	21 0	10	20	4,200	—	—	1 3	3	5	4
Women's Ward - 1	—	27 6	21	20	11,550	—	—	—	3	5	4

The hospital is so placed as to receive the full benefit of the prevailing winds. The windows open inwards, and their arrangement and construction are conducive to ventilation and coolness. The wards are provided with ventilating windows 3 ft. by 2 ft., and ventilating holes, &c., &c., above and below the flooring lines, which is sufficient to keep the wards at all times sweet. The windows and doors are all glazed. There are no jalousies or jhilmils.

7, 8. There are no means for cooling the air admitted into the wards; but they are warmed by means of two fire-places in each ward. The walls and ceilings of the wards are cleansed and whitewashed once in six months, or oftener if required.

9. The privies are properly drained and not offensive.

10. The lavatory arrangements of the hospital are good and sufficient.

11. A small bath room is attached to each ward sufficient for all ordinary purposes. There is also a good-sized washhouse for the sick, who are sufficiently well to walk about. These are supplied with water troughs, containing chatties of burnt clay, and the refuse water runs into a drain; there are also several bathing tubs in the building. Puckalies or water carriers are daily employed.

12. The hospital linen is not washed on the premises, there is a contract for this, and there is always a sufficient quantity of clean clothes and bedding.

13. The building used as a purveyor's store is very dry, but perfectly inadequate for the strength of a large regiment. There is a small and compact building consisting of two rooms purposely erected for a purveyor's store, and used for the convalescent depôt patients, sufficiently large for this purpose and very dry.

14. The bedsteads used in hospital are a solid framework of teak wood, and plaited with broad cotton tape about 2½ inches wide; these are very comfortable and cleanly, as the tape can at any time be removed and the framework washed. The mattress is simply a paillasse filled with straw, which is difficult to procure at this station, and therefore they are very thin, but no inconvenience is felt. There are also sheets, blankets, pillowcases, and quilted covers. I think it would be an improvement to have iron bedsteads with sacking bottoms. Coir mattresses would not only be a great comfort, but also in the long run a saving to Government.

15. There are two kitchens, situated at one end of the hospital square, and removed from the wards, which are on each side, and completely separated from the hospital. They have each a large fire-place, running from one end to the other, and places built with brick to receive the wood and cooking utensils. These means are sufficient. The diets in

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	most instances are properly cooked, and can be varied at all times; still, I think iron ranges would be very desirable. Peat will be obtainable in any quantity at no great distance from this station. 16. No reply to this query. 17. There is a hospital serjeant, whose duty is principally to see that the wards are kept perfectly clean, that the patients are regular, and that the hospital servants perform their offices properly. A return of a full hospital establishment in this country is here given. Some slight difference to the present time has been made at this station in employing five European orderlies, who are deducted from the native strength. The plan has answered admirably.

Hospital.	European Nurse.	Head Commi-copoly.	Assistant do.	Cook.	Do.'s Mate.	Coolymaistry.	Coolies for Leechings, &c.	Ward Coolies.	Cooly Women.	Sweepers.	Toties.	Puckalies.	Tailors.	Washermen.
Her Majesty's 3rd Battalion, 60th Rifles -	1	1	1	1	1	1	3	8	1	3	3	2	2	2

18. The construction of the hospital is well adapted for its purposes, and its sanitary condition is perfect. It is situated on an elevated piece of ground open in every direction, and has wide passages from one end of the building to the other, and leading from the wards to the privies, which latter buildings are kept clean and free from effluvia by means of a powerful stream of water passing through them. No hospital gangrene or pyæmia has appeared.
19. The present accommodation should be increased. 84 beds only can be made, and the strength of the battalion has been 1,200. There should be separate wards for treating certain diseases, such as ophthalmia and itch. There is no place for the treatment of an insane patient.
20. Convalescents who are able to take exercise walk out daily for a certain time. There is plenty of ground around the hospital, but it has never been enclosed. When this has been completed, it would be desirable to have some trees planted and seats set apart for the use of the sick.
21. There is a female ward, with nurses' quarters attached to the hospital, and the soldiers' wives and children are at all times admitted when sick, and never treated at their own quarters. The accommodation is very small for the strength of the regiment, but complete with bath rooms, &c. A separate building should be erected in the hospital environs, more capacious than the present female ward and nurses' quarters; this would greatly enlarge the hospital and give three other wards for the treatment before mentioned in No. 19.
22. Not aware of any special local hospital regulations, not included in the general Presidency Medical Regulations.
23. The Medical Officer has the power of suggesting anything necessary with regard to sanitary state of hospitals, but the power of deciding is vested in the General; repairs are always attended to. Change of diet and medical comforts are left entirely to the direction of the Medical Officers. The diet roll is forwarded at the end of each month to the Superintending Surgeon of the division.
24. There are no convalescent wards, although desirable they are not essentially necessary. Men are never discharged from hospital until considered in a fit state to partake of their ordinary barrack diet. Their duty is not imposed on them until they have attained sufficient strength. They are walked out once or twice daily with a non-commissioned officer, but not allowed to enter the canteen without a pass from the Medical Officer.

XIII. Burial of the Dead.

1. The burial ground used by British troops is three-fourths of a mile from the barracks. Neither of the prevailing winds from the burial ground blows towards the cantonment.
2. Its area is 12,000 square yards, the drainage is good. Decomposition does not take place rapidly in consequence of the dryness of the ground.
3. The grave space allowed is 18 square feet, and the interval between the graves is from 3 to 4 feet. Their depth is 6 feet at least, and they are never re-opened.
   Interment is not compulsory at any fixed period after death; but it generally takes place within 24 or 36 hours. This would be left to the discretion of the Medical Officer in charge. No native soldier has died since I have had charge of this station.
4. The graveyard is never offensive.
   Burials take place at 7 a.m. and 5 p.m. generally.
5, 6, 7. The dead of camp followers and bazaar people are buried. No injury accrues to the public health from the present practice. No improvements to suggest in the burial or disposal of the dead.

(Signed) B. G. Ward, President, Commanding Station.
G. W. P. Sparrow, M.D., Surgeon, 60th Rifles.
(No date:) H. F. Kennedy, Major, 60th Rifles, Commg. 3rd Battalion.
W. T. F. Farewell, Captain, Special Executive Engineer.

WELLINGTON.
MADRAS.

APPENDIX.

MARCHING INSTRUCTIONS.

Office of Deputy Inspector-General,
Her Majesty's Hospitals,
Madras, September 30, 1857.

SIR,

As the officer who is to have command of will be furnished by the Deputy Adjutant-General of Her Majesty's Forces with some instructions, having in view the preservation of the health of the men on the march, and as you have been nominated to the medical charge, I have to direct your attention to the following additional points for your guidance, which, in conjunction and with the authority of your Commanding Officer, you will endeavour to carry out as strictly as circumstances will permit.

1st. You will endeavour to procure from the Commissariat tarpaulins for the men to lie on, and as much straw as is allowed. I have recommended blankets also, which you will indent for. They are now issued to every Queen's soldier in the Presidency.

2nd. Each morning before starting, and in the evening, if you think it advisable, you will give the men a couple of grains of quinine,* if there is any diarrhœa or predisposition, accompanying it with 10 or 15 drops of laudanum; quinine should be continued, for a week or 10 days, afterwards occasionally to be given, particularly in jungly districts. The men will also get their half a pint of coffee or tea, or ginger tea, before and during the march.

3rd. On arrival at camping ground, care must be taken that the tents are pitched on the driest, most elevated, and favourable spots, previously chosen by the Medical Officer and Quartermaster in advance, each tent to be fumigated with the fumes of coffee, which can be easily done by throwing powdered coffee on a red-hot iron, or burning it in an open chattie. This should never be neglected where it is supposed any disease or fever exists on the road. Besides this, in a very jungly country fires must be lighted on the spot selected for each tent, and fires also ignited to windward of the camp. In choosing the camping ground, care must be taken, as far as possible, to avoid the vicinity of villages, swamps, and tanks, at all events, to choose ground as far as can be from and to windward of them.

4th. Every soldier on the march must be obliged to wear his cholera belt and flannel waistcoat, of each of which he ought to have three. After the tents are pitched the non-commissioned officer of each should see that the men change their flannel and stockings, which should be hung up and dried. If men on a march are obliged to be exposed to the sun, I would recommend their having a handkerchief, doubled, tied round their head, under their caps, and occasionally wetted.

5th. A place to leeward of the camp must be set apart for the men to use as privies, if a camp is likely to be detained more than one day, a regular latrine, or several, ought to be established, and unless a supply of lime is procurable, they must be filled up each day and new ones made. Strongly recommend your Commanding Officer not to permit men to leave the camp under any pretence whatever. No fruit should be allowed to be purchased except under the authority of a Medical Officer.

6th. Every means must be taken to insure personal cleanliness, bathing should not only be permitted, but encouraged; if a bathing place is not obtainable, the men should be induced to wash themselves all over once a day.

7th. If possible, native women should not be allowed to accompany a body of soldiers on a march; this you will recommend to your Commanding Officer and endeavour to have orders issued to prevent their coming into camp or congregating in the neighbourhood of camps.

8th. When the Medical Officer has decided on the ground for camping, and found the best water, he will hand the latter over to the Quartermaster, who must place a sentry over it, to prevent its being defiled in any way. Great care must be taken to prevent the men drinking any water that has not been examined by the Medical Officer, and when it is known that none along a line of march is fit for use, additional puckalies and bheesties should be allowed, and advantage taken, where pure water is obtainable, to fill the skins, or, if in a place where chatties are procurable, to have the water carried by coolies in them.

9th. In case of cholera or any serious illness occurring among the soldiers, the camp should be moved at once to higher ground and to windward, an immediate message (telegraphic, if possible) sent to the Deputy Adjutant-General, the Deputy Inspector-General, and to the nearest station, to obtain assistance, so that Medical Officers, doolies, required articles of medical comforts, or medicines unexpectedly wanted, should be supplied with the least possible delay.

10th. Should cholera prevail, the greatest attention must be paid to have all excretions carried some distance away to leeward, and buried.

11th. Weakly men should be marched in the rear, under the charge of a non-commissioned officer, having their arms carried for them, which will be a means of preventing this description of soldiers from filling the doolies, and embarrassing the means of carriage.

12th. Several Medical Officers in charge of corps having adopted the plan of sending forward their sick in the afternoon of the day preceding the march of the main body, and reported favourably of the practice, the same is recommended to be adopted whenever convenient, or when the Medical Officer considers it advisable, as the sick thus get better rest at night, and are not disturbed at the early hour in the morning when the others march, and have the opportunity of taking their medicines at the most appropriate time.

13th. When cholera, or any other epidemic disease makes its appearance, the nature of the locality where it originates, and the state of the weather at the time should be particularly noticed, with any other circumstance which may appear connected with its production. "Vide Book of Medical Regulations on the point, page "57, and para. 27 to 35."

14th. All casualties during the march are to be reported according to the annexed form, and in the event of any unusual sickness, or other untoward event occurring en route, the Medical Officer will immediately inform the Deputy Inspector-General of it, and transmit a daily state of the sick, with such observations as he may deem satisfactory.

15th. A marching journal is to be kept by the Medical Officer in charge, of occurrences and observations (as per annexed example), which is to be transmitted to the Deputy Inspector of Hospitals at the termination of the march.

16th. It is required also that a diary be kept of the cases, noting symptoms, &c.

I have the honour to be, &c.
(Signed) J. E. WILLIAMS,
Deputy Inspector-General,
H.M. Hospitals.

True Copy,
GEO. W. P. SPARROW, M.D.,
Surgeon, 3rd Battalion, 60th Rifles.

* It is found three grains given in the evening in a little arrack answers very well, and is more easily administered to the soldier at that time than in the morning.

EXAMPLE.

Diary of Occurrences and Observation on the March.

13th December 1857 (*the place of starting to be here mentioned*). Commenced our march from Poonamallee at 3 o'clock, and reached at quarter past 8 a.m., distance 13 miles. The men seemed rather fatigued. They had half a pint of coffee, with a crust of bread before starting; (*or, as the case may be,*) supplies good. Thermometer at 3 a.m. 77°; on arrival at 8 a.m. 82°; at midday 88°. Morning stormy; midday cloudy; afternoon clear. Two cases of fever and 3 of dysentery admitted. No cholera. The sick left at 4 o'clock the preceding day, and arrived at 8 p.m., without casualty (*or as the case may be*).

Daily Return of Sick.

Alterations.																									Remarks.
Remained	+	-	-	+																					
Admitted	+	-	-	+																					
Total	-	-	-																						
Discharged	-	-	-	+																					
Died -	-	-	-	-																					
Remaining	-	-	-	-																					

14th December (*Name of place*). Recommenced our march at 4 o'clock a.m., and arrived at (*name of place*), at half-past 8, distance 10½ miles. The men did not seem fatigued: had half a pint of warm coffee before starting (*as the case may be*). The encamping ground high, but wet from rain, which fell while we were on the march. Men provided with straw to sleep upon (*or not*). Small-pox, cholera, bowel complaint, or fever prevailing among the inhabitants of the district (*or not*). Carriage sufficient (*or deficient*).

Daily Return of Sick.

Summary at the end of diary
Commenced march on
Completed ditto

Route.

Dates.	Name of the Village.	Stages.		Dates.	Name of the Village.	Stages.	
		Miles.	Furlongs.			Miles.	Furlongs.

Strength { at starting - - -
at end of march - -
Sick admitted during the march -
Discharged - - - - -
Transferred - - - - -
Died - - - - - -
Remaining - - - - - -

(*Signature.*)

Nominal Return of Casualties during the March.

Corps.	Rank and Names.	Age.	Diseases.	Date of Admission.	Date of Death.	Duration of Disease.	Number of Years in the Station.	Remarks.

True Copy, (*Signature.*)
GEO. W. P. SPARROW, M.D.
Surgeon, 3rd Battalion, 60th Rifles.

RAMANDROOG.

Hill Station, Queen's Troops - - - 50

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is dry and hilly, covered with jungle and tropical vegetation. The water supply is scanty. No stagnant water exists in the neighbourhood. 2. The elevation of the station above the sea is, by the aneroid, 3,300 feet; above the adjacent country, 1,000 feet; and about 300 feet above the large tank. There is no higher or healthier ground adjoining the station. 3. The station is situated on a table land. 4. The nearest river is the Toongabudda, which is about 20 miles off; the vicinity of the station is not liable to overflow. There are ravines in the hilly formation of the station, but they are quite healthy. 5. The station is open and freely ventilated, and the temperature has never been observed to have been raised by reflected sun-heat. It is much exposed to winds from all quarters, but they are not prejudicial to health. 6. No cultivation of any description is carried on, either in the surrounding country, or in the neighbourhood of the station, nor do any works of irrigation exist near. 7. There is a native bazaar about a quarter of a mile from the station. 8. The station, as before mentioned, is situated on table land of a hilly range, the soil and sub-soil of which is hard rock. 9. No water has ever been found below the surface on which the cantonment is situated. 10. From the formation of the table land the rain water readily passes off, and never remains long on the surface. No drainage from any higher ground passes into the subsoil of the station. 11. The water supply is derived principally from a large tank, but there are springs at some distance below the hill top, whence in the season a good supply of pure water is obtained. Water is stored in a tank below the top of the hill, more than a mile distant from the station. It is generally full. There are a few common weeds growing on the margin of the tank, but there are no animals in it. I regret to say that it is used for bathing purposes as well as for drinking. The tank receives its water from the drainage of the adjacent country, and of course is the receptacle for everything the waters may carry down. No nuisance or malaria, however, proceeds from this source.

RAMANDROOG. MADRAS.

References to Subjects and Queries.

REPLIES.

I. Topography—*cont.*

12. The amount of the available water supply, its chemical composition, or microscopic character are not known with anything like accuracy; but the supply has always been found sufficient, and its qualities excellent. It is distributed by bullocks carrying leather bags. No better water supply is available.

13. The station is remarkably healthy, and there are no other topographical points bearing on its sanitary condition to be remarked upon beyond the foregoing replies.

14. I am not aware of the mode of proceeding in the selection of new stations; but I believe in India political considerations have prevailed over all others in selecting stations for troops.

II. CLIMATE.

1. The instruments available at the station for conducting and registering meteorological observations are a dry and wet bulb thermometer and a pluviometer.

2. Table of meteorological observations from 1st January 1856 to 31st December 1860.

Months.	Barometer, Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.
		°	°	°	°	°	°	* °	ins. cent.	
January		70	9	77	64	73	62	88	—	E.N.E.
February		77	9	83	70	75	65	91	0 1	E.N.E.
March		79	9	85	72	77	65	92	0 11	E.N.E.
April		78	8	85	73	75	67	95	1 3	E.N.E.
May		76	7	80	72	78	68	90	5 10	W.S.W.
June		72	5	75	69	74	67	77	3 13	S.W.
July		70	4	73	67	73	67	75	7 10	S.W.
August		70	5	72	67	71	67	75	7 2	S.W.
September		69	5	74	67	73	69	77	5 13	W.S.W.
October		72	7	76	70	69	68	85	7 12	W.S.W.
November		69	8	75	66	69	65	84	1 4	N.E.
December		68	8	72	64	72	64	82	0 7	N.E.

* For four years only, from January 1857 to December 1860.

3. The climate is salubrious, the thermometer never rising higher than 84° in the shade. Hot winds are never observed here, even in the hottest months, viz., March and April. During the rainy season, June, July, and August, the hill is covered with a thick mist, till about 10 a.m., which returns about 8 p.m. September and October are very pleasant months, but during November and December the weather is decidedly cold, a very strong wind blowing during the night and early part of the morning. There is no canal irrigation. From the middle of March till June all convalescents are better here than in the plains, no matter from what diseases they have suffered. During the cold and rainy season, there are some diseases very apt to be aggravated, such as rheumatism, chronic and acute, hepatitis, consecutive syphilis, and pulmonary affections. The clothing is varied for different men; being all convalescents, some men require their winter clothing, while others can wear their light clothing. The healthy months include those from September to January; from April to August being unhealthy. Fevers, rheumatism, hepatic and pulmonary affections are among the prevailing diseases, during the latter months, which do not deserve the name of "unhealthy."

4. My experience is of such short duration, that I cannot say from actual knowledge whether there is any district near the station possessing a more healthy climate than Ramandroog.

5. I have had little or no experience of stations in India, so as to speak of their comparative salubrity, my service having been in America, West Indies, Mediterranean, &c., &c.

III. SANITARY CONDITION OF STATION.

1, 2, 3. A ground plan and elevation of the barracks are transmitted.

4. Table of barrack accommodation:—

Date of construction, completed 1853–59.

Total number of rooms or huts - - - - - 10
Total regulation number of non-commissioned officers and men - 50

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.					Ft.	Ft.
2	14	$33\frac{3}{4}$	27	$17\frac{3}{4}$	$1,617\frac{3}{8}$	$1,155\frac{5}{14}$	$65\frac{1}{14}$	$1\frac{1}{2}$	2	6	4
2	9	$33\frac{1}{4}$	$15\frac{3}{4}$	$17\frac{3}{4}$	$9,384\frac{1}{8}$	$1,042\frac{7}{10}$	$58\frac{2}{5}$	$1\frac{1}{2}$	—	—	—
4	1	$15\frac{2}{3}$	$9\frac{2}{3}$	$17\frac{3}{4}$	$2,687\frac{7}{12}$	$2,687\frac{7}{12}$	$151\frac{5}{12}$	$1\frac{1}{2}$	1	6	4
2	Used for stores.			—	—	—	—	—	1	6	4

5. The windows open inwards. There is a verandah all round the barrack, the front being enclosed. The front verandah is often occupied as sleeping quarters.

6. The bedsteads used are wooden, which are very bad, as the buildings are swarmed with bugs. Iron would be much more preferable.

7. No tents are used at the station.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	8. The means of ventilation are— 1. By ventilators near the ceiling, which can be opened and shut by ropes at will. 2. The windows. 3. The doors, of which the upper half are venetians. This in the wet and windy weather is a great disadvantage, as the damp air cannot be shut out. I would recommend that there be half glass doors inside the other doors, so that they could be shut in cold and wet weather without obstructing the light. They are so made at Trimulgherry barrack, Secunderabad, the outer half venetians there opening outwards, and the inner half glass opening inwards. It would be well to retain the venetians, as during the hot months they are useful as means of ventilation. 4. By a fire-place in each room. Ground ventilation is, however, much required. No artificial means are used for cooling the air of the barrack room. 9, 10. The barracks are constructed of stone, as also are the floors which are raised above the ground level, but have no perflation of air underneath. 11. The materials used in the construction of the barracks are suitable to the climate. The public buildings and cantonments are kept in repair by the district engineer under charge of the quartermaster-general's department. The officer commanding is responsible for the general sanitary state of the cantonment. The walls and ceilings of barracks are white-washed annually, about the commencement of the year. 12. The men's wash-houses being built on the edge of the hill, permit of easy drainage from their position. They are supplied with water by puckallies. There is no bath-house, the want of which is much felt. 13. The cook-houses are supplied with water by puckallies. The drainage is effected in a similar manner to that of the wash-houses. The linen is taken down to the low country to be washed, and this is one of the great drawbacks to this station, very great difficulty and inconvenience being felt at the depôt from it. 14, 15. The privies and urinals are built on the edge of the hill, which acts as a natural drain. These buildings, as well as the barracks, are lighted at night with oil in lamps, suspended from the ceiling. 16. The barracks being built close to the summit of the hills no drains are required, the natural drainage being sufficient for carrying away readily all surface water, &c. No part of any building used as a barrack or hospital is damp. The fluid refuse of the barracks is taken down the hill. There are no cesspools. No foul ditches exist near the station. 17. The surface cleansing of the cantonment is performed by the lascars daily. 18. The surface of the cantonment is kept free of vegetation. There are no old walls, thick hedges, &c. to interfere with the ventilation of the station. 19. There is no military bazaar, though one is much required, as everything required by the soldier has now to be purchased by him at an exorbitant rate. The civil bazaar is crowded, and not kept as clean as it might be, nor the hill generally. The bazaar is entirely under the civil authorities. It is about half a mile from the government buildings. No nuisances experienced in barracks from wind blowing over the native dwellings. 20. Animals are slaughtered below the barracks, so low that no inconvenience is experienced; but I believe the Rajah of Loondoor is very much averse to beef being killed on the hill. 21, 22. No replies to these queries. 23. The accommodation for married non-commissioned officers and men is sufficient for the present number.
Officers' Quarters.	There are no officers' quarters.
IV. Health of the Troops.	1. The station itself is very healthy, and is the resort of all who are able to come during the hot months. The native population is also healthy. In the plains, in the surrounding districts, cholera sometimes rages in the native villages, but never reaches the station itself. 2. Cholera is, I believe, the most frequent disease among the natives in the district, but I have not attended any case. I have seldom any natives to treat, and am, therefore, unable to give any opinion regarding spleen disease. Those native patients I have seen have been isolated cases of amaurosis, ovarian tumour, &c. 3. The natives are healthy on this hill, which is probably owing to the small population here, and the absence of extremes of heat and cold. 4. I am unable to state at what stations the troops were previous to coming here, as almost every two or three men come from a different station, and have also been different lengths of time at their previous stations. The principal stations from which men are sent here are Bellary and Secunderabad. I have not observed any difference in the healthiness of the men's present accommodation. 5. The troops are never camped out here. 6. This is a hill station, though of comparatively slight elevation above the neighbouring plain, and the only one at which I have been stationed. My experience is that it is good for every class of disease except, perhaps, bowel affections. During the cold damp weather (but only during that time) men convalescent from dysentery and diarrhœa suffered relapses, and were sent to the plains in consequence. They were mostly young soldiers belonging to the 1st Battalion 1st Royals; convalescent from fever, hepatitis, syphilis, sympathetic bubo, &c., all improved. This opinion regards convalescents only, there being none others here. 7. I have not been sufficiently long in India to form a decided opinion as to whether troops who have been resident for some time on the hills are more or less liable to attacks of febrile or other diseases on returning to the plains. 8. From my limited experience as regards the subsequent liability of troops to disease on the plains, I can only express a qualified opinion that hill stations are the best. 9. There are no diseases, that I am aware of, peculiar to hill stations, to which troops are liable. I know nothing of other hill stations. 10. I am unable to say what precautions as to diet, clothing, &c. the men should take to guard against attacks of disease, and to enable them to derive the full benefit of a residence in hill districts.

RAMANDROOG. MADRAS.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*.	11. With regard to the best seasons for residence in such stations, this station can be occupied the whole year round with advantage to health. If the period is necessarily limited, I think the months of March, April, May, June, and July the best, as it is then hottest in the plains. The shortest period of residence should be from one year to 18 months, as convalescents do not thoroughly recover their natural stamina and health under one year. 12. I do not think that there is any period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service in the plains; but I have little more than one year's experience of India on which to form an opinion. 13. I am not aware of any special precautions required for protecting the health of troops on leaving hill stations for the plains, except the self-evident ones of light clothing, and as little exposure to the sun as possible. 14. I am of opinion that to locate troops at hill stations, about 4,000 feet above the sea, would preserve them in a very effective state, but my experience is so slight that I only speak from analogy. I think frequent change of station in the plains is decidedly beneficial to health. 15. I know nothing of the barrack and hospital accommodation at other hill stations. 16. I have no experience to show what ranges of elevation are most suitable as sites for hill stations. 17. There is no higher ground near this station which could be advantageously occupied as a hill station. I have been to the opposite range of hills bounding the Sundoor valley on the east. They are about the same height, but there is a very small supply of water. The distance from summit to summit of the two ranges is about seven miles. 18. I am unable to form an opinion from inexperience of the particular classes of surface and subsoil most healthy for stations. 19. Soldiers proceeding to India should be from 21 to 26 years of age, and should land there about the commencement of the cold season. I don't know how troops are disposed of on first landing. I did not come out with troops, and have not been stationed at a port. On first landing I would provide them with good barracks, and keep them in healthy stations, when possible I would not expose them to the sun or to fatigue. I would also prevent the abuse of ardent spirits, and provide them with books, racket courts, &c. 20. I do not see the slightest use in sending troops to intermediate stations previous to sending them to India. With regard to sending them in the first instance to hill stations, my experience is slight, but I remember a lot of recruits joining the 1st Madras Fusiliers in April 1859. During that hot weather I (Dr. Houston) was attached to that regiment, and I do not think the recruits were so much in hospital as older soldiers. I very much doubt whether the early years of service are the most dangerous, and I know of no extraordinary means of preventing sickness among recruits. The rules to be observed by all Europeans are temperance, moderate exercise, avoidance of fatigue and exposure to the sun, cleanliness, &c. 21. Water transport is, I think, the best for troops going to the interior, but there is little of it known to me. Transits are the only other means I know of, and should, I think, be used when possible for Europeans. If it is necessary to march, the marches should be short, and the men should not be moved in large masses, as cholera is then to be feared. Hot coffee should be issued to the men before moving off the ground, and as soon after the new ground is taken up as possible. 22. A British soldier's service in India should not exceed 12 years. From 10 to 12 years is the proper period. 23. I have no information to afford in reference to the manner of conducting the business of medical boards either at stations or at the presidencies, or whether it is such as to avoid conflict of opinion as regards invaliding. 24. The best time of year for invalids to leave India for home is at the end of January.
Diseases.	1. There is an inspection by the medical officer for the discovery of incipient diseases once every week at seven o'clock a.m.; the same on the march, with extra ones in cases where ophthalmia or other contagious diseases are suspected. 2. There is no scorbutic disease here. 3. It is impossible to reply to this question regarding the proportion of cases of hepatic disease usually under treatment, and the cause to which it is attributable, as the strength here varies greatly, and the men all come here sick or just recovered. The disease does not occur here, though men who have had it in the plains have relapses. The causes of the disease are many and varied, but I cannot speak with authority on the subject. I know of nothing except temperance in eating and drinking likely to make it less frequent. 4. I have not seen a single case of dracunculus among Europeans. 5. Last year in the hospital of the 1st Madras Fusiliers at least half the sickness was from the venereal disease. At this station no case has occurred of primary affections in my six months experience. The establishment of lock hospitals is urgently called for in the large stations, and I see no other means of protecting the health of the soldier. 6. The only diseases of the epidemic or endemic form that the soldiers suffer from here are— *Fevers*—An occasional attack of ephemeral fever at the commencement of the hot season. This is comparatively rare. *Dysentery*—In the wet season men convalescent from dysentery, &c. sometimes suffer relapses. This may be considered endemic. (*Vide* "Hospitals," 18.) *Cholera* is never seen here. *Small-pox*—None ever seen. *Rheumatism* never occurs as the result of local influence. Those who suffer from it are mostly convalescents from syphilis. The men who are here suffer from diseases contracted elsewhere, and are not much affected by any of these diseases here. If they come here with such diseases and do not immediately recover they are transferred. No deaths from any disease have occurred for more than six months.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	7. It is impossible for me to give any answer to this question touching the nosological character of the more frequent zymotic diseases, the time when such diseases are most prevalent, the climatic and atmospheric conditions which precede or accompany their appearance, the sanitary condition of the station, &c., where such diseases are prevalent. The number of people under observation is so very small, and the diseases have so little to do with this station, that no answer can be of the slightest value. 8. No epidemic has occurred here in my experience, I have no knowledge of any connexion between the soldiers' habits and the prevalence of epidemic disease, nor have I observed that soldiers are an ill-conducted class either on the march or at the station. 9. Quinine has not been tried at this station, as there is no malarial disease as a rule. On the march of the Bellary column from Bellary to Secunderabad in November 1858, and on their return in February 1859, every man of the 74th Highlanders had three grains of quinine in a half-dram of arrack each morning when the parade was formed. A proportionate amount of arrack was taken in a vessel belonging to each company to the hospital tent at night, and the quantity of quinine (according to the number of men in each company) was placed in this by the apothecary, and dissolved in the spirit. On the warning for parade being sounded in the morning an orderly corporal fetched the mixture or rather solution, and with a tin measure served out the proper quantity to each man. The whole proceeding did not take 10 minutes, and there was no fever, or only a few isolated cases on either march, out of about 500 men, and for about 120 miles north of Kurnool the way lies almost entirely through a jungly country. This was done at the recommendation of Surgeon Macbeth, 74th Highlanders, and is my personal experience, as I was with the regiment the whole time.
V. Intemperance.	1. As a rule there is no intemperance here; cases do occur, but rarely; there are no confirmed drunkards. 2. Directly, there have been no admissions into hospital from diseases caused by intemperance. Indirectly it is impossible to say whether intemperance at regimental head-quarters may not have been a cause of bringing on the disease for which a man is sent here, and owing to a relapse of which disease he may be admitted into this hospital. No return showing the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at this station, as there is no drunkenness here, and all the men come here sick. Drunkenness *per se* is punished as an offence. 3. Arrack is sold in the canteen, but not in the bazaar. The quality is good, and the amount consumed per diem is, taking the average, each,—for serjeants, $3\frac{3}{7}$ drams, out of three serjeants; for privates, $1\frac{1}{7}$ drams, out of 30 privates. Some men take no arrack, others draw their full amount of two drams. Serjeants are allowed as much as they require, and as all serjeants here take it, the average is rather high. It is not the habit of the men to take a dram before morning parade, nor does spirit form part of the ration, the men have to pay for it. It is never given to convalescents. No drinks other than intoxicating drinks are sold in the canteen. 4. It depends entirely upon the previous habits of the individual whether the consumption of spirits is conducive or injurious to health. In moderation it is not injurious in my opinion, but I would not advise men to commence the use of spirits who had been hitherto unaccustomed to them, and on the other hand it would be very injurious to deprive a man accustomed to them, of their moderate use. Too much spirit is subversive of efficiency and internal discipline. 5. We think it advisable to restrict the quantity of spirits per diem at present purchasable by the soldier at the canteen, and to abolish the sale of them in the bazaar, which is the rule at this station. 6. We are of opinion that the use of malt liquor is preferable to the use of spirits, but would not on that account abolish the sale of spirits, only restrict it within reasonable limits. We do not think wine preferable to malt liquor. 7. Coffee is taken every morning by the men before they go out. Lemonade is occasionally procurable at the station, but soda water is not. I imagine neither spirits nor malt taken in moderation is prejudicial to health or discipline. 8. We think it best to give the soldier his choice of a restricted quantity of beer or spirits daily. Tea or coffee already forms part of the ration. 9. It would be beneficial to prohibit the sale of spirituous liquors in the bazaar, if necessary. 10. I would recommend that a regular canteen be allowed, as the men are badly off in the way of any amusements. 11. There is no regular canteen here. The men get their ration of spirits or beer between 11 and $11\frac{1}{2}$ a.m. and 3 to $3\frac{1}{2}$ p.m. daily, Sundays excepted, when they get it after morning church, the evening issues being as on other days.
VI. Diet.	1. The ration for Queen's British troops and for European troops in the Indian army is the same, and consists of 1 lb. of meat, 1 lb. of bread, 1 lb. of vegetables, 4 oz. of rice, 1 oz. of salt, $\frac{5}{7}$ oz. of tea, and $2\frac{1}{2}$ oz. of sugar. A responsible inspection is made of the constituents of the ration by an officer daily. 2. A complete ration including vegetables is provided daily, the stoppage for which is four annas. They have three meals a day, viz., breakfast at 8 a.m., dinner at 1 p.m., and tea at 4 p.m. The proportion of vegetables is generally 12 oz. of potatoes, and 4 oz. of onions. 3. I have not been here long enough to form any opinion as to whether the ration could be improved, but at present the married people sent up here are very badly off, as it is impossible for them at the exorbitant prices charged to exist without getting into debt. A provost serjeant and assistant have orders to prevent any sale of rations. 4. The cooking is performed by natives, who are supplied with copper boilers (tinned inside), and frying pans by the Government; they supply their own earthern pots. The present kitchen is far too small; it is kept clean by the cooks under the superintendence of an orderly, and they are inspected by an officer. Whether the food is boiled or roasted is left to the option of the men, no complaint has been made of the cooking. The morning coffee is prepared by one of the married soldiers, and is supplied to the men before morning parade. 5. A garden has been purchased for the station, but it will be impossible to keep it up unless an allowance is given by Government, the men being here for so short a period that they will not take any interest in it. The garden might be turned to good account and

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Reference to Subjects and Queries.	Replies.
VI. Diet—*cont.*	supply the depôt with various kinds of vegetables, provided an allowance was given to keep it up, and work it or set it going for a couple of years. At present the soldier derives no benefit from it.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress at this station is as follows:—A red cloth jacket, a red cloth tunic, 1 pair of cloth trousers, 2 pairs of regimental boots, 1 forage cap, 1 dress cap or shako, 6 pairs of white trousers, or in the 74th Highlanders thin trews, or in the Artillery thin serge, 4 white jackets or tunics, in the 1st Royals and the Artillery and in the Highlanders, 2 khakee summer frocks and 1 red serge tunic or frock, 1 white calico shirt, 2 colored calico shirts, 3 pairs of worsted socks, 4 pairs of cotton socks, 2 flannel waistcoats, 2 flannel cholera belts, 2 cap covers, 1 pair of braces, and 1 great coat. The arms and accoutrements are left with the men's different corps, but there are 15 sets which were sent here at the time of the mutiny. Each consists of 1 cross belt, 1 waist belt with frogs, 1 bayonet scabbard, 1 pouch for rounds, 1 pouch for caps, and 1 musket with a bayonet. The present guard dress I leave to be decided by the medical officer from time to time. He has to send to me his suggestion on the subject, which I have found the best plan. A verandah is the protection from sun and wet for the sentry at the guard room, the only sentry I am enabled to have.
Duties.	1. I imagine it would be desirable that all troops for every purpose be drilled at home before coming out to India. 2. Route marching, except on medical inspection days and cleaning barrack days, is the usual routine of parade, as it is found that the men receive more benefit from the Droog by this parade than drill, which could only be carried on in a small squad. The duration is from 1½ to 2 hours daily. The best hour for morning drill is, in the summer, 6 a.m., and during the winter, 7 a.m.; for evening drill, summer and winter, 4½ p.m. The average number of nights the men have in bed during the week cannot be fairly given, as in the winter the hill is almost empty. 3. The guard-room is about 100 yards from the barracks; guard lasts for 24 hours; roll-calls take place at uncertain hours during the day and night.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation at the station:—A ball court and skittle-ground are being constructed; there is a schoolmaster lent from the 74th Highlanders; a library and reading-room is very much wanted, and has been already recommended, as also is a day room or soldiers' club. There is a soldiers' garden, but no means of keeping it up; workshops and a gymnasium are very much wanted, the latter has been already recommended. There is no theatre. A reading-room is much wanted here, as also a workshop, which might be turned to good account, the men having nothing to kill time. The reading-room would also do for a church, as at this station, during the season, all the visitors attend Divine service, which is performed in a very miserable thatched mud building. During the monsoon the place is very damp, and must be injurious to health. 2. I have already recommended a gymnasium and reading-room. Provided a canteen was sanctioned in time, sufficient means might be gained to provide different amusements for the men. I have commenced already quoits, football, trap, bat, and ball, and have prepared ground for cricket; I also recommend workshops. 3. Savings banks are kept up at the head-quarters of their regiments for the men stationed here. 4. There is sufficient shade from trees, &c., to enable the men to take exercise without injury to health during the day, but they are fast disappearing, and I have brought the subject under the notice of the civil authorities.
IX. MILITARY PRISONS.	1. There is one solitary cell, at this station, in good order.
XII. HOSPITALS.	1, 2. The hospital runs parallel to the barracks. It is to the north, in which direction both barracks and hospital face. There are no stables. It is a considerable distance from the bazaar, and not at all interfered with or influenced by it. No native houses except in the bazaar, and the European houses are dotted over the hill at considerable distances from the hospital and from each other, nor is there anything to impede the most perfect ventilation. The site is very healthy, both as to elevation and drainage (the latter from the sloping structure of the hill), and also as to the absence of malaria. 3. The water supply is abundant and wholesome. 4. There are no means of drainage, except the sloping structure of the hill. At present the baths, &c., are emptied by natives carrying the tubs out and upsetting them at a little distance from the building. Most of this water is carried away, but no doubt a small quantity sinks into the subsoil, but not sufficient to exert any injurious influence on the health of the patients. 5. The wards are paved with granite, and raised an average of 2 feet by a layer of stones, earth, gravel, &c. There is no perflation of air underneath the floors. The roof-water is carried off by spouts, and is carried away by the natural sloping structure of the hill. A small quantity may sink into the subsoil. There is no surface drainage or guttering round the hospital, except the natural slope of the hill. This is sufficient to carry away the rain-fall rapidly. There are verandahs on both sides of the building, sufficient to afford shelter from the sun's rays; never used for the sick, although convalescents sit in them morning and evening. The hospital consists of one flat. No table of hospital accommodation is transmitted. The hospital is so placed as to receive the full benefit of the prevailing winds. The windows open inwards, the upper portion being fixed, and their construction is conducive to ventilation and coolness. 6. The means of ventilation are:—1st., by ventilators near the ceiling, which can be opened and shut at will by ropes; 2, the windows; 3, the doors, of which the upper half are venetian; this, in the wet and windy weather, is a great disadvantage, as the damp air cannot be shut out, and the wards are, on account of the stone floor, all liable to be damp and chilly, and exercise a bad influence in cases of bowel complaints. I would recommend that there be half-glass doors inside the other doors, that could be shut in cold and wet weather, without obstructing the light. They are so made at Trimulgherry barracks,

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	Secunderabad—the outer half venetians, opening outwards, and the inner half glass, opening inwards. It would be well to retain the venetians, as in the hot weather they are useful as means of ventilation; and, 4, a fire-place in each ward. These are quite sufficient to keep the wards free from odour and closeness. 7. There are no means of cooling the air, nor are any necessary here. In the hot months there is often a cool breeze during the day, and every night about ½ past 7, a westerly breeze sets in. 8. There is one fire-place in each ward, and wood fire for warming them. The floors are cleansed and whitewashed once a week, and the inside walls and ceilings once a year. The outside of the building is never whitewashed at all. 9. There are no privies or urinals connected with the hospital, though they have lately been recommended to be built by the deputy inspector-general of H.M.'s hospitals. At present there are nightstools placed in a little room adjoining each ward. This would be very offensive were there many men in hospital, but as there are generally very few (so many being convalescents) it is not so at present. Privies will become a necessity when the barracks are enlarged and a greater number of men sent up. The soil is removed and the stools are cleansed by natives. 10. The present lavatory arrangements are two shallow earthenware dishes placed on a form in the room above mentioned, there being as a rule only two or three men in hospital; as only men requiring active treatment are taken in there, the arrangements are sufficient, but decidedly inconvenient. 11. There are two tubs in the same room for bathing purposes, and hot water has to be carried from the cook room. After being used the tubs are carried out by natives, and the water thrown away. In the damp and cold weather this room is very chilly and there are no means of warming it. The deputy inspector-general of H.M.'s hospital has recommended bath rooms, lavatories, and privies to be built. 12. The linen is washed by natives at the tank. This is the usual method in India and is sufficient. 13. The storage is insufficient by one half, and not dry. There are no proper stores, but a small room at one end of the building is appropriated to that purpose. 14. The bedsteads in use in the hospital are low cots with tapes; the bedding consisting of cotton quilts and blankets. 15. The hospital kitchen is a portion of the barrack kitchen. There is one native cook, the natives are very ingenious in cooking with a very meagre supply of utensils, so that at present the apparatus is sufficient. The deputy inspector-general of H.M.'s hospitals has recommended a cook-room to be built behind the building, which with the privies and lavatories will be at a little distance enclosed in a kind of back yard. When more men are sent up, no doubt further arrangements will be carried out. The diet can be sufficiently varied. 16. Copies of the diet tables, diet rolls, &c., are transmitted. 17. The hospital establishment is, besides the medical officer, one assistant apothecary to carry out the treatment ordered by the medical officer, and dispense the medicines, and at this station to assist in correspondence, making up returns, &c.; one hospital serjeant to carry out the discipline of the hospital, and assist in making out returns, &c.; 2 hospital coolies to attend on the patients, one toty to cleanse the stools, &c., six dooly bearers to carry out patients to take the air, &c. Besides these an orderly soldier from the sick man's company or depôt can always be obtained in case of necessity to attend a serious case. These means are sufficient. 18. The hospital is a particularly healthy one, not at all liable to epidemics, and Lieut.-Col. Archer, who has commanded the station for the last four years, states that cholera never appears; any cases that have happened have been in individuals who have lately come from the plains, where cholera may have been raging; they may suffer from it and die, but it never spreads. The only affection at all approaching the character of an epidemic is that, in the cold damp weather, men who are convalescent from dysentery and other bowel affections are liable to relapses. This is my experience during the winter season of the year. Several men were sent to the plains who were almost all young soldiers belonging to the 1st battalion, 1st Royals, stationed at Secunderabad, where dysentery had been epidemic, and who had only lately come to India. Men convalescent from fever, &c., rapidly recover their strength, and sympathetic bubo also, which has been during the last two seasons, at the fall of the year, almost epidemic in the 74th Highlanders at Bellary, disappears almost without treatment. 19. No reply to this query. 20. The whole establishment is composed of convalescents, and there are plenty of shady walks about the hills for them to take exercise in, but no place or seats specially set apart for that purpose. 21. There is no provision at present for the treatment of soldiers' sick wives and children, as until the married men's quarters were constructed lately, very few women or children were ever sent here. A hospital for women and children at the east end of the present hospital, and joining it, is recommended and sanctioned; at present they must be treated in their own quarters. The present arrangements are sufficient, but when the married men's quarters are fully completed the women's hospital will become a necessity. 22. No reply to this query. 23. With regard to change of diet and medical comforts within his hospital, the medical officer has the entire control, subject to his own superior medical officers. In reference to the sanitary state of the hospital and the repairs of buildings, he can recommend only the carrying out of the recommendation depending entirely on the will of the commanding officer. The practical working of this is that the carrying of it out, and perhaps the making of such recommendation may depend a good deal on the relation existing between the medical and commanding officers. 24. In reference to the necessity for convalescent wards, it may be again stated that the whole establishment is a convalescent depôt, and only men requiring active treatment are taken into hospital.

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References to Subjects and Queries.	REPLIES.
XIII. BURIAL OF THE DEAD.	1. The distance of the burial-ground from the barrack is about 200 yards, and it is badly placed as regards winds. 2. Its area is about half an acre, and it is with great difficulty one can get sufficient depth, never without blasting. The graveyard is badly placed as regards position and soil. A much better position in every respect might be found a short distance down the hill at a point not inconvenient. 3. The space between each grave is two feet, and the depth depends on the soil. They have never yet been re-opened. Interment is compulsory at ordinary times within 24 hours. 4. Very few interments in the graveyard. British soldiers are buried by the officer commanding. 5. The dead of camp followers or bazaar people are buried on the side of the hill. 6. No injury accrues to the public health from the present practice that I am aware of. 7. It would be a great improvement to form the burial-ground lower down the hill, where more soil is procurable, as at present it is on a rock.

(The replies having reference to the health of troops and hospitals are signed by Assistant-Surgeon Chester, 74th Highlanders, and partly by Assistant-Surgeon Houston, Madras establishment.)

July 29, 1861.

(Signed) F. WELLS, Major Commanding Depôt, Ramandroog.

GUNTOOR.

Accommodation, Native Troops, Infantry { 1 Major, 1 Captain (European) / 3 Subadars, 4 Jemadars - / 20 Havildars, 22 Naigues - / 6 Drummers, 262 Privates - / And 3 Puckallies - - } 322.

Reference to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is dreary towards the south and east. To the north and round (by west) to the south-west it is bounded by fine ranges of hills. Throughout the eastern talooks it is flat and dry, but the northern and western sections of the district are hilly. There is no jungle in the vicinity of the station, and no wood of natural growth, with the exception of the borassus flabelliformis, and acacia arabica. The station and native town, however, are crowded with trees that have been planted to the number of about 4,000. The most common are varieties of the Ficoid family and Azadirachata Indica. They afford shade, modify temperature, and add to the salubrity of the station. 2. The height of the station above the sea is 100 feet. It is on a level with the adjacent country. The nearest water is the river Kistnah, distant about 20 miles, and a canal, about six miles, supplied with water from the river, There is higher ground behind the jail or to the north-west of the station, a open level space about four square miles in extent; it is all under dry cultivation, and at an elevation of from 20 to 30 feet above the level of the station, with a gentle slope towards the south and west. Water of excellent quality is found there in abundance at a depth of 40 feet, and as it is sheltered on all sides by lofty trees, it would be an admirable locality for the lines of a native corps. 3. The nearest mountain is one of the range called Kondaveed, rising about 1,000 feet above the level of the station, and is distant about 12 miles. 4. The sea is distant about 35 miles. The vicinity of the station is not liable to inundation. There is no broken ground, ravines, or water pits in the neighbourhood affecting the public health. 5. The entire station with the exception of one small suburban village is freely exposed to the winds, and although crowded with trees, these are all lofty, so that free external ventilation exists. In the native town too the streets are wider and the houses less crowded than usual, but from their faulty construction fresh air is entirely shut out from the inhabitants. The increase of temperature by reflected sun heat is obviated by the presence of so many large trees. Sometimes during the months of November and December intensely cold winds from the north or north-west set in, and continue for five or six days, which induce in Europeans severe colds, and in the native population smart attacks of simple continued fever. The sea breeze blows pretty constantly every evening during the hotter months of the year, with a most pleasant and salutary effect. Land winds blow at times with great strength. 6. The whole of the surrounding country is under cultivation. The canal from the Kistnah river approaches to within six miles of the station, and when completed will be still nearer. Its water has been of immense benefit for purposes of cultivation, and has yielded a healthy supply for drinking in villages when wells were insufficient. Since the canal became available for purposes of irrigation, and large tracks of previously arid country have been flooded with water, the heat during the hot months would seem to have been less disagreeable. Rice is not cultivated in the neighbourhood of the station; neither indigo nor hemp is cultivated or prepared near the station. 7. The bungalows of the officers in the station are built on an open space surrounded on three sides by the native town. The sepoy lines are located in a corner of the bazaar, and the guard room, garrison, hospital, and arsenal are situated in the centre of the bazaar. 8. The surface soil of the larger portion of the district is black soil, resting on a subsoil of decomposed gneiss rock; below that, at a depth of from 10 to 20 feet, a hard gneiss rock is reached. Lime also is found in various parts of the district in the common shape of small irregular nodules mixed with gravel and sand. Marble of various colours, clay, slate, and

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	iron ore are found in the western talooks of the district. The characteristic systems of the entire district, however, are the gneiss and mica schist. The station stands on a red soil, chiefly composed of the decomposed gneiss. Its site has been occupied by native population from time immemorial. 9. Water is usually found during the dry season at a depth from 40 to 60 feet below the surface, and during the rainy season about 20 feet below the surface. 10. There are no surface springs in the district, and the rainfall partly flows away, and is partly absorbed by the porous ground in the neighbourhood of the station, and is thus drained off. The drainage from the adjacent higher ground does not pass into the subsoil of the station. 11. The water supply is derived from wells and tanks; the majority of the wells, however, are in a great measure dependent upon the tanks for the supply of water, and they again are dependent upon the rainfall; the water is partly stored in tanks, which are open. After the rainfall the extent of tank service in the station will be about one square mile. In the bazaar a reservoir for water was dug by Government some years ago; it is about 40 feet square by 60 feet deep, being dependent on springs for its supply, and there are in general from 20 to 9 feet of water in it. The tanks are generally dry during the months of March, April, and May. They contain the usual amount of infusoria, but very few aquatic plants proper. When dry their beds to some extent become covered with dry land grasses and weeds. All the tanks are used more or less for bathing purposes, and the "red tank" which feeds numerous reservoirs and wells is much frequented by dhobies. The wells are not liable to pollution from leaves or other matter falling into them, but the tanks form receptacles for many impurities, and some foul drainage. None of them constitute a nuisance or give off malaria. 12. The supply of water is never superfluous, and it is frequently insufficient, so that water has, in dry years, to be brought in casks from a distance. In color it is clear, with no perceptible taste, and no smell; the water of some of the wells, however, contains saline particles, which become encrusted on the sides of the glass during evaporation. The water of the "black tank" holds in solution a small quantity of the nitrate of potass. The water of these has a saline taste. There are no means of performing an accurate chemical analysis, but a microscopic examination of the water has been made, and the quality found to be good and not injurious to health, but decidedly insufficient in quantity. It is raised for domestic purposes by manual labour in leather buckets; a constant and abundant supply might, at a trifling cost, be brought in by means of a small aqueduct from the canal already referred to. Many of the natives are most anxious that this should be done. 13. Guntoor is within the influence of both monsoons, so that the heat of the earlier months of the hot season on this coast is very much moderated by occasional falls of rain. 14. The responsibility in the selection of new stations seems to be too much divided and amongst different departments, and the enquiries as to topography, climate diseases, &c., at times too limited to afford the requisite information. The selection of a site for a new station should be entrusted to a board or committee of officers, all men of considerable service and tried experience, one military, one engineer, and one medical officer would form an efficient board. A subordinate of the medical department might then be posted on the selected site for at least one year, to keep an accurate meteorological register, and record of diseases most prevalent amongst the native inhabitants; if these should prove satisfactory, then building operations should commence. As, however, this test would be often insufficient, it would be advisable to post one or two companies of a corps in huts or tents on the new site for the space of one year, subsequent to the preliminary observations before commencing the more expensive building operations; there should also be an officer of health attached to the quartermaster general's department fully supplied with sanitary statistics with regard to every locality in the Presidency.
II. Climate.	1. The means and instruments at the station available for conducting and registering meteorological observations are, a barometer and dry bulb thermometer, and a rain gauge in the charge of the medical officer. During the past six months a wet bulb thermometer has been added.

Table of Meteorological Observations for five years, from 1st January 1855 to the 31st December 1859 inclusive.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Sun Temperature at 4 p.m.	Mean Rain, inches.	Winds. Direction.
		°	°	°	°	°		
January	29·953	75	15	82	68	85	0·000	E. & S.E.
February	29·732	79	12	84	73	92	0·000	S.E. & E.
March	29·758	83	20	91	72	96	0·850	E. & S.E.
April	29·846	86	11	91	81	118	2·450	E. & S.E.
May	29·761	89	11	94	84	101	4·600	W. & S.W.
June	29·706	90	11	94	84	106	4·050	S.W. & W.
July	29·699	87	7	86	80	94	5·932	W. & S.
August	29·728	83	7	87	81	91	7·670	W.S. & S.W.
September	29·756	82	6	84	79	93	5·651	W.N. & S.
October	29·718	79	12	81	70	89	7·025	W.S.W. & E. (variable).
November	29·891	62	10	81	72	88	2·097	W. (variable).
December	30·018	60	15	79	65	88	1·	N.N.W. N.E. & E. (variable).

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. The climate of Guntoor may be stated to be dry, warm, and not subject to sudden variations of temperature. Fogs occasionally prevail towards the end of December or in the beginning of January. The air is quite free from dust or other impurity. The climate would seem to have a most beneficial effect on convalescents from malarious fever, beriberi, &c. Prisoners suffering from beriberi are constantly being transferred from Masulipatum to the jail here, and after a short residence become quite well. This would therefore form one of the best places for the location of a native corps that could be selected along the coast. The detachment of the 2nd N. V. battalion stationed here has always enjoyed excellent health. From the following return it will be seen that the most healthy months are July, August, September, October, and November. It would seem, therefore, that sickness succeeds the first heavy falls of and continues throughout and after the cessation of the rains.

The table gives the average number of sick of Det. 2 N.V. Batt. admitted monthly into garrison hospital during five years, Jan. 1855 to Dec. 1859, inclusive.

Months.	Average Admissions Monthly.	
January	7⅘	Average strength 304.
February	10⅕	
March	9	
April	9⅘	
May	9	
June	8⅕	
July	10⅖	
August	12⅕	
September	15⅖	
October	15¾	
November	11	
December	9⅕	

The most healthy months are December, January, February, March, April, and May (the dry months of the year), the prevailing diseases during the unhealthy months, are intermittent fever, rheumatism, dropsy, and bowel complaints; this statement refers to the civil population also.

4. I am not aware of any district near the station the climate of which is more conducive to health than that of the station.

5. The following are the stations at which I have served, with observations on their comparative salubrity:—St. Thomas Mount, extremely hot and relaxing to the European constitution. Kirkee, Bombay, cool and healthy, but fresh arrivals subject to diarrhœa, hepatitis, and fever. Poona, Bombay, much the same as Kirkee, and in both dysentery also is a not uncommon and frequently fatal disease. Masulipitam, hot and decidedly unhealthy for European troops. Trimulgherry Barracks, Secunderabad, variations of temperature sudden and extreme; hepatitis, dysentery and fever very common and fatal. Bolarum, Hyderabad, variations of temperature considerable, but far more healthy than the neighbouring cantonment of Secunderabad; hepatitis common amongst officers. Bombay, hot and relaxing, the town barracks being most unhealthy, and quite unfit for the reception of Europeans; Colaba barracks are more healthy, but very hot, and often scourged with cholera.

III. SANITARY CONDITION OF STATION.

1 to 23. No information under this head.

Officers' Quarters.

1. The officers' quarters are in fair condition, roomy, and in a satisfactory state as regards drainage and ventilation.

IV. HEALTH OF THE TROOPS.

1. The native population of the station and the surrounding district are healthy; the jail is the healthiest in the presidency. The Palnaud, a remote portion of the district, is unhealthy during a few months of the year.
2. The most prevalent diseases amongst the native population are febris intermittens, and remittens, diarrhœa, rheumatism, anasarca, syphilis, primitiva et consecutiva, variola, cholera, and morbi cutis.
3. The healthiness of the neighbouring population is attributable to absence of miasma, plenty of work, liberal remuneration, and plenty of wholesome water and food.

4 to 17. No reply to these queries.

18. It may be stated generally that European troops seem to suffer from bowel complaints in granitic districts, but whether this is dependent on that physical confirmation of the surface of the country, which is characteristic of primitive districts, or on the nature of the soil, no statistics hitherto published enable us to speak with precision.
19. Soldiers proceeding to India should be from 20 to 25 years of age, and should land there in October, November, and December for the Madras Presidency.

20, 21. No reply to these queries.

22. Regiments, as a rule, ought not to remain for more than ten consecutive years on the plains of India, for although many of the men may, after such a period retain their health and strength, yet the corps, as a whole, will have lost much of its physical energy, and been decimated by disease.

23. No reply to this query.

24. Invalids proceeding home by the Cape should leave India during the months of February and March.

Diseases.

1, 2. No reply to these queries.

3. Cases of hepatic disease are extremely rare amongst native soldiers.
4. Dracunculus is a rare disease among the civil population. I am not aware that a single case of it has been admitted from amongst the sepoys of the 2nd N. V. battalion in Guntoor.
5. Out of an average annual strength of 314 there have been 72 admissions into hospital during the year 1858–59, from all diseases, in the detachment, and of these admissions two were on account of venereal diseases; the proportion, therefore, which those sick from venereal complaints bear to the total sick in hospital from all other diseases is about 2·77 per cent.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	6. The troops at the station suffer from the following diseases:—(1.) Quotidian and intermittent fevers; the proportion of admissions from these diseases to total admissions during 1858–59 has been 34·71 per cent. (2.) Dysentery; the proportion of admissions from this disease to total treated during 1858–59 has been 1·38 per cent. Cholera and small pox rarely occur, but the proportion of admissions from rheumatism during 1858–59 has been 15·13 per cent. The admissions for these diseases have been in the proportion of 51·38 per cent. to total admissions during the year. 7. The cases of fever have been invariably quotidian, and of a very mild character; dysentery is never frequent nor formidable. Cholera is, under all circumstances, so uniform in its character that it requires no remarks. Variola; this disease is common amongst the civil population and in general confluent, or semi-confluent. Rheumatism is in general chronic, but of a very obstinate character. Venereal complaints are frequent and disastrous amongst the civil population. Fever is most common immediately before or about the beginning of cold months; cholera prevails in general in May, June, and July; rheumatism is most frequent during the rains; variola is in general seen early in the hot season; an elevated temperature seems to have a fostering influence on variola and cholera, and cold are inductive of rheumatism. The lanes and streets of the town are kept remarkably clean, but in the houses there is a want of ventilation and cleanliness. The scarcity of water in the station prevents, in some measure, the native population from performing ablution to the extent necessary for the due maintenance of a healthy skin. 8, 9, 10. No reply to these queries.
V. Intemperance.	No information under this head.
VI. Diet.	1 to 3. No reply to these queries. 4. The food is always boiled by the native troops, the men or their wives preparing it for themselves. There are no kitchens. The men do not use coffee or tea, but take conjee before a march. 5. Gardens for the cultivation of vegetables by the soldiers could not be advantageously established near the station.
VII. Dress, Accoutrements, and Duties.	1. 2. The usual routine of soldiers' duties are the guards, from which the men do not suffer The men have five nights in bed during the week. 3. Guards are mounted at 200 yards distance from the barracks, and last for 24 hours. There is one roll call at half-past five p.m. daily; but there are none at night. The health is not affected by night guards or night duty.
VIII. Instruction and Recreation.	1. There no means of instruction or recreation at the station, and no restriction is placed on the men with regard to exposure out of barracks off duty, as the men at the station are all natives. 2. No suggestions can be made as to any means of recreation or employment for native troops. 3. In this detachment the men do not lodge money in the Savings Bank. I cannot therefore form an opinion as to whether their institution would be advantageous or not. 4. There is sufficient shade for the natives to take exercise without injury to health during the day.
XII. Hospitals.	1, 2. The garrison hospital of Guntoor is situated near the centre of the bazaar, with an open space of small extent immediately in front of it. The civil dispensary is situate quite close to the hospital, which is surrounded on all sides by buildings, walls, &c., which interfere with the ventilation. The site is not higher than that of the surrounding buildings, but there is sufficient slope to carry off the rain-fall. It is not obnoxious to malaria, but nuisances in the neighbourhood are common enough. 3. The water has to be brought from a distance on the back of a bullock; it is quite wholesome. A well sunk in the neighbourhood to the depth of 50 or 60 feet would afford a constant supply. 4. There is no sewer leading from the hospital, the drainage being entirely surface drainage. Refuse water and ordure have to be carried to a distance. 5. The verandahs are never used for the accommodation of sick or any others. The winds are in a great measure shut out by surrounding buildings. The windows are fitted with solid wooden shutters, the very worst arrangement that could be adopted in a hospital, as natives are fond of shutting out every breath of fresh air. 6, 7. No reply to these queries. 8. The walls of the wards are whitewashed once a year, or oftener if necessary. 9 to 13. No reply to these queries. 14. The cots used in the hospital are made of iron. 15, 16. No answer to these questions. 17. One standing orderly is allowed for the hospital, and if any patient is in a helpless condition, he is permitted to have an orderly comrade. 18. The hospital is in a satisfactory condition, and is very rarely visited by epidemic disease, and then never, except such disease is prevalent outside. 19, 20. No reply to these queries. 21. When requisite the families of sepoys are attended in their own houses. 22, 23, 24. No answers to these questions.
XIII. Burial of the Dead.	1, 2, 3, 4. No reply to these queries. 5. The dead of bazaar people are disposed of according to caste. Some are burned, and others buried. 6. The practice of burying amongst the houses of the town is decidedly prejudicial to health. 7. All existing Mahomedan burial grounds within the limits of the town should be closed in future, and new places at a little distance from the town substituted.

No date or signatures.

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Accommodation.—Native troops, infantry, one regiment, 741.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is black and brown. It is flat, stony, and dry, with a range of hills to the south-east. There is very little wood and no jungle in the vicinity of it. It is situated between two rivers, the Tumboodra to the north, and the Hendry to the south. The former has water in it the whole year, but the latter is nearly dry, excepting for a short period during that term.
	2. The height of the station above the sea is 800 feet, but it is somewhat below the level of the adjacent country. The ground rises immediately around the station, especially to the south-south-east and south-west, and the village of Sonderapand would offer an advantageous position for military purposes.
	3. The range of small hills about four miles to the east are, I should say, between four and five hundred feet above Kurnool; the slopes run up into peaks or ridges, but there is no table land. They may be pronounced uninhabitable.
	4. The nearest waters are the rivers Tumboodra and Hendry, which run close to the station: but the vicinity is not liable to overflow. There is no broken ground, ravines, or water pits near the station.
	5. The station is open and freely exposed to the wind, but the walls and buildings being all built of stone and granite, the temperature is greatly raised by the reflected sun heat. The chief winds that blow over the camp are those from the north-east, east, west, and south-west, which are land winds; they have no prejudicial effect on the health of the station, which is good.
	6. The surrounding country is cultivated during part of the year, but no works of irrigation at present exist, although some are about to be commenced. There is no cultivation of rice or indigo, nor is the preparation of flax carried on near the station.
	7. The native town and station are the same, and the native population is about 30,000.
	8. The geological structure of the district is slate and granite, with a superficial layer, varying mostly from a few inches to two feet, of either black mould or clay resting on it. The station occupies old ground.
	9. Water is found during the dry season at a depth of 31 feet below the surface, and during the rainy season at a depth of 16 feet.
	10. The station being situated on a ridge between two rivers, close to their junction, the surface water flows readily off. The depth of soil varies from one to three feet, and below that is laminated slate, limestone, and then granite. No well can be depended upon to afford a supply of water during the hot weather, unless it is carried below the bed of the river to which it is nearest. No drainage from higher ground passes into the subsoil on two sides of the station, nor is it affected by the drainage of the third side.
	11. The water supply of the station is obtained from the two rivers and wells. That obtained from the river Hendry is at all times pure and excellent. There are no tanks.
	12. The supply of water is plentiful, and that of the Hendry and from the wells supplied by it is clear, inodorous, and well tasted. It is raised by Pacottahs when the river is full, and distributed by watermen in leathern bags carried by bullocks, the people supplying themselves by means of vessels. When the river is dry, the water is readily obtained by digging holes in the sand.
	13. No reply to this query.
	14. The sites of stations cannot always be selected with a single view to topography, climate, diseases, &c., as it may be necessary to locate troops, more especially natives, in places for various causes known to be extremely unhealthy.
II. Climate.	1. The instruments available for conducting meteorological observations are a barometer, a dry and wet bulb thermometer, and a pluviometer.
	2. Table of meteorological observations for three years, taken from January 1857 to December 1859.

Months.	Barometer. Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb. ?	Mean Wet Bulb. ?	Mean Sun Temp.	Rain. Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January - - -	29·088	78	9	80	75	9	3	99	—	E.	—	—	
February - - -	29·109	82	10	85	79	10	4	100	—	SW.	—	—	
March - - -	28·983	88	9	91	86	9	4	110	—	„	—	—	
April - - -	28·932	91	7	93	90	7	4	116	2·7	„	—	—	
May - - - -	28·928	90	11	93	88	11	3	112	8·10¼	„	—	—	
June - - - -	28·103	86	10	88	84	10	3	103	14·4½	„	—	—	
July - - - -	28·104	84	8	85	82	8	3	96	17·17	„	—	—	
August - - -	28·813	82	7	83	81	7	3	92	8·4	„	—	—	
September - -	28·888	83	8	84	81	8	4	97	8	W.	—	—	
October - - -	28·909	83	8	85	81	8	5	94	8·7½	SW.	—	—	
November - -	29·245	78	7	80	76	7	4	88	4·4	E.	—	—	
December - - -	29·142	77	9	79	74	9	3	93	—	„	—	—	

3. The climate is generally hot and dry, but salubrious and pleasant during the rainy season, or throughout the year, excepting the hot months of March, April, and May. The ordinary shelter and clothing are the only precautions required, the whole of the year being generally very healthy.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	4. The only place in the Kurnool district adapted for Europeans are the Nullayntallay hills, the highest peak of which is 3,500 feet above the sea, and water can be found at an elevation of 3,200 feet. The temperature is about 15° lower than in the plains; fever is not known, although there are extensive jungles. These hills are about 60 miles from Kurnool, and, in a strategical point of view, for the location of British troops, their position is most favourable. 5. I have served at the following stations:— Viziagapatam, the cantonment Waltair—very healthy. Singapore—very healthy. Malacca—very healthy. Cuddapah—fevers prevail. Chingleput—healthy. Rangoon—pretty healthy for Europeans, but decidedly unhealthy for the natives of India.
III. Sanitary Condition of Station.	1, 2. No reply to these queries. 2 to 6. There are no European troops here, and native troops do not reside in barracks. 7. Tents for Europeans are square, double poled, with two flys, and those for natives are double poled, with a ridge between them, and have but one fly, sloping downwards from the ridge to within a foot of the ground, and closed in by a curtain.

Dimensions of Tents for Troops.	European.				Native.			
	Feet.	Inches.	Number.		Feet.	Inches.	Number.	
			Double.	Single.			Double.	Single.
Fly, length from pole to pole	6	7	—	—	10	—	—	—
Breadth from centre of cap to edge of fly	11	3	—	—	10	—	—	—
Cords, length, &c.	27	—	4	24	6	—	—	23
Shells, breadth from cap to edge of shell	9	—	—	—	—	—	—	—
Cords, length, &c.	9	—	4	24	—	—	—	—
Walls' height	5	—	—	—	1	9	—	—
Bamboos and loops at the bottom	—	—	—	36	—	—	—	21
Poles, length to cap of inner tent	10	3	—	—	—	—	—	—
Between the caps	1	6	—	—	—	—	—	—
Cap's diameter, small	—	$7\frac{1}{2}$	—	—	—	—	—	—
Cap's diameter, large	—	$7\frac{7}{8}$	—	—	—	—	—	—
Thickness	—	$2\frac{1}{4}$	—	—	—	—	—	—
Door pole, length, &c.	6	—	—	—	6	—	—	—
Projection to cover door, length	5	—	—	—	5	2	—	—
Ditto ditto breadth	4	2	—	—	3	9	—	—
Dimensions within fly — length	21	—	—	—	22	—	—	—
Dimensions within fly — breadth	15	—	—	—	12	—	—	—

The number of men of each arm, when marching in a body allotted to each description of tent, is shown in the following table:—

Description of Tents.	Europeans.				Natives.						
	Horse Artillery, without Harness.	Cavalry, including Saddlery.	Foot Artillery.	Infantry.	Horse Artillery without Harness, but with Saddlery.	Cavalry, including Saddlery.	Horse Field Battery, without Harness.	Infantry.	Gun Lascars or Karkhana Drivers.	Sappers.	Recruits.
Tent, European	19	20	25	25	—	—	—	—	—	—	—
„ Native	13	13	13	13	20	20	25	25	25	20	25

8. No reply to this query.
9. The Sepoy lines at this station are constructed of stone in mud walls, and a roof composed of wood scantling and bamboos, covered over with an impervious clay. This kind of roof is, I think, peculiar to Kurnool. The cavalry lines are built in the same way. Tents are made of common country cloth, lined with the same material, dyed a dark blue colour.
10. The floors of the lines are usually of rammed earth, raised a little above the ground. To add to the comfort of the dwelling, one of the females of the family plasters it over with cow dung every morning.
11. I believe the materials used in construction are suitable according to native ideas. It would be difficult to make them build their houses in a different way. The public buildings are kept in repair by the District Engineer. The Senior Medical Officer in the station is *ex officio* Sanitary Officer. The public buildings are whitewashed once a year.
12, 13. There are no men's lavatories or cook-houses, and linen is washed and dried in the rivers.
14, 15. There are no privies or urinals at Kurnool, with the exception of one urinal in the gaol, which is simply a trough and a tub. The tub is emptied every morning, and the contents conveyed away in buckets. It is not lighted at night at all nor are the lines, unless done by private individuals.
16. The lines being situated on a ridge, sloping off on either side, they are sufficiently drained by a few ditches, about 3 feet wide by 3 feet deep, which quickly disposes of the surface water. The barrack and hospital are dry. There are no foul ditches, but the native houses in the fort and town have each a necessary, very few of which, if any, are ever cleaned. The old fort ditches are the resort of many natives for the purposes of nature, but they are never cleaned.

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References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	17. The general state of the surface cleansing within the cantonment and its vicinity is very bad. The privies in each native Mussulman's house are never cleaned, there being no conservancy establishment in the town or station. 18. The surface of the cantonment is kept free of vegetation. The ventilation of the station, bazaar, &c., is greatly interfered with by old walls, &c., which could be advantageously removed, especially the wall round the fort adjoining the south gate. 19. The drainage of the bazaar is bad. There is a great want of cleanliness, and it is much crowded. No latrines exist, nor are there any regulations for preserving due cleanliness. The native houses are small, close, and confined. Out of a population of 30,000 souls, 20,000 are supposed to be Mussulmen. Every Mahomedan house contains a cess-pit and dung heap, which is never cleaned or removed. No nuisance is experienced in the lines from wind blowing over the native dwellings. 20. No regulations are enforced regarding slaughtering places. The natives kill animals wherever they like, and they never clean the place afterwards. 21. The natives picket their horses, tattoos, &c., where they like, very often in the street. No regulations existing on the subject. Buffaloes, &c., roaming about the station undisturbed day and night. 22. The stables of the Kurnool Irregular Horse are built of slate bedded in mud, and covered with the mud roof already described. The lines are about a mile from the town, where the men keep their families. I never saw any lights in the lines at night, but there is abundance of light and ventilation during the day. The manure is sold, and there are no dung heaps. The men and native officers are obliged to be in their lines by 10 at night. The horses are picketed in rows of stables; both are the private property of the native officers. 23. There are no married men's quarters.
Officers' Quarters.	There are no officers' quarters. The officers rent anything in the shape of a house they can get.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining native population are healthy. 2. The prevailing diseases among the native population are fever and rheumatic affections. Cholera occurred as an epidemic last year, but this station is not particularly subject to it nor to spleen disease. 3. The healthiness of the native population is attributable to the dry even climate, and to their being in a sufficiently prosperous condition. 4. The troops were previously at Madras, where the regiment remained one year after their return from Burmah. They have suffered since from fever and rheumatic affections, and last year from cholera, which occurred as an epidemic. No portion of the men's accommodation is more unhealthy than the rest. 3. The troops are never camped out. 6, 7, 8. I have never been in charge of troops at hill stations, but I decidedly approve of their selection for the location of troops. 9. It depends upon the topography of the hill station, what are its peculiar diseases; if it is not cleared of jungle, fever and dysentery may be expected among the troops on going to it. 10. For Europeans, precautions as to clothing, shelter, diet, &c., are necessary to enable them to obtain benefit from residence in hill stations. For the natives I believe the plains are preferable. 11 to 13. No experience at hill stations. 14. Frequent change of station on the plains is not beneficial to the health and spirits of troops. 15, 16. No replies to these queries. 17. There is no higher ground near the station which could be advantageously occupied as a hill station except a hill range distant about 40 miles to the east, viz., the Nullamallays, which might be so. It is not easy of approach, and the climate has not been sufficiently tested. 18. No experience of the classes of surface and subsoil, more healthy or unhealthy than others for stations. 19. Soldiers proceeding to India should be from 20 to 25 years of age, and should land there in November, the beginning of the cold season. Recruits should not be much worked or exposed to the sun on landing; their minds should be kept employed, and they should be prevented from frequenting the bazaar and toddy shop. 20. Troops for India had better be sent to an intermediate station, and on landing in India in this presidency should be sent to Bangalore. 21. The mode of transport of troops from the port to the interior is by railway or by ordinary marches. 22. A British soldier should serve in India 15 years. 23. No reply to this query. 24. Invalids should leave India for home in the middle of January, so as to arrive in May.
Diseases.	1. All the recruits and recruit boys are paraded weekly for medical inspection. 2, 3. There has been no scorbutus among the troops at the station nor any case of hepatic disease. 4. Some cases of dracunculus have occurred and are attributable to drinking the water of the river Tumboodra, it occurs independent of any other disease. The means of prevention are to drink pure wholesome spring water, or when not procurable, to boil the water first and filter it afterwards. 5. The only means for diminishing venereal diseases is by rendering men liable to punishment for contracting them, as the Government loses his services for the time through the effects of his own imprudence, and moreover his efficiency as an able-bodied effective soldier is thereby often permanently affected. A man concealing such disease should be more severely punished, as much will depend upon its coming immediately under the eye of the medical officer. As respects native troops I do not consider Lock Hospitals necessary. 6. The troops suffer from the following diseases:— *Fevers.*—Chiefly of the quotidian intermittent type. *Dysentery.*—Some cases have occurred.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	*Cholera* occurs occasionally as an epidemic, as at other stations. In 1854 and 1859 it occurred in a virulent form. *Small-pox.*—Some cases have occurred. *Rheumatism.*—The men suffer from this disease both in the acute and chronic form. Three-fourths of the admissions occurred under one or other of these diseases, and eight-tenths of the total deaths also occurred from these causes. 7, 8. No reply to these queries. 9. Small doses of quinine have not been tried at this station as a prophylactic against malarial diseases. 10. The station is, I believe, healthy. The native houses are very confined, the habits of the natives, especially amongst the dense Mussulman population, preclude preventive measures. They are also exceedingly filthy as regards drainage and the accumulation of excrementitious matter about their houses. This is prejudicial to the general health of the station, the authorities might consider it necessary to interfere with it.
V. Intemperance.	1. It is very rarely the native soldier ever gets drunk, as they very seldom use intoxicating drinks. No other information is conveyed under this head.
VI. Diet.	No rations are issued in Kurnool, there being no European troops.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of a red tunic, black linen or woollen trousers, and a head dress made of wicker covered with black varnish; the accoutrements are a waist-belt, shoulder belt, 40, and 20 round pouches, musket and bayonet. The dress is as suitable as any other for native soldiers. Native prejudices admit of little improvement being attempted in regard to their dress, particularly the head-dress now in use, for which they are not willing to substitute any other.
Duties.	1. European soldiers would be better drilled at home, or at an intermediate station before being sent to India. 2. The routine of a soldier's duties are guards and orderlies, detachments, drill five days in the week early in the morning for about one hour. The native soldiers do not suffer in health from drill. The best hour for drill is early in the morning; but there are general orders regarding marches. The average number of nights the men have in bed during the week is three. 3. The guards mount about a ¼ of a mile from the Sepoys lines at the station. There are no night roll calls, but once a day there is a roll call, except when prevented by other duties.
VIII. Instruction and Recreation.	1. There are no means of instruction and recreation at this station for native troops. No restriction is placed upon native soldiers in reference to exposure to sun and rain when off duty. 2, 3, 4. These queries are not applicable to native troops.
IX. Military Prisons.	1. There are 2 solitary cells which answer the purpose for which they are intended very well.
X. Field Service.	1. No local regulations for field medical service not included in the general presidency regulations exist. 2. Commanding officers always consult the medical officers in charge regarding the encamping grounds, &c. 3, 4. There is no sanitary establishment attached to troops on the line of march.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1. The hospital is a large commodious building originally intended for Europeans, it is about 200 yards from the place of arms, far removed from any stables, and about 100 yards from any native houses. Being situated in the fort it is not very open but is well ventilated, and probably quite airy enough for natives. It is more healthily situated than other buildings in the fort, and there are no nuisances in its vicinity. 3. The water supply is brought from the Toombadra, about 180 yards distant. 4. The drainage water, &c., runs off freely from the hospital site into the Toombadra. 5. There is no perflation of air under the floors of the wards. The roof water falls on the subsoil and drains into the Toombadra, and the surface drainage and gutterage is quite sufficient. The hospital is built of stone in Chunam, it has a pent roof with flat and pantiles. It is quite cool enough for natives. The building has an enclosed verandah on each side, but they are never used for the accommodation of sick or others. The hospital consists of one flat. Table of hospital accommodation :— Total number of wards, 6; verandahs, 3; and a surgery. Total number of beds, 60.

Wards. No.	Regulation No. of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area and Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Weight.
								Feet.	Arches.	Feet.	
1 Ward - -	40	129	22	25	42,570	1,064	70	2	11	12	6
1 „ - -	2	12	12	13	1,862	831	70	2	1	8	4
1 „ - -	2	16	10	13	2,080	1,040	80	2	1	8	4
1 „ - -	2	12	10	13	1,560	781	60	2	1	8	4
1 „ - -	2	12	12	13	1,862	831	70	2	1	8	4
1 „ - -	12	36	21	25	18,900	1,575	63	2	3	12	6
1 Verandah -	- -	126	10	13	16,380	- -	- -	- -	7	8	4
1 „ - -	- -	103	10	13	13,390	- -	- -	- -	5	8	4
1 „ - -	- -	60	10	13	7,900	- -	- -	- -	2	8	4
1 Surgery - -	- -	44	11	13	6,292	- -	- -	- -	3	8	4

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References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The hospital is not so placed as to receive the full benefit of prevailing winds, but will get enough for natives. The windows are Venetian, opening and shutting by means of hinges, and fastened by bolts. The hospital is also provided with ventilators above, that swing on an axis. These means are quite sufficient to keep the wards free of odour or closeness. 7, 8. There are no artificial means for cooling or warming the air. The walls and ceilings of the wards are whitewashed once a year. 9. The privy consists of a small spot of ground about six feet square, surrounded by four walls. It is not drained, but cleared every morning; and is not offensive, unless upon approaching very near it. 10–12. There are no lavatory or bathing arrangements for the sick, or any means for washing and drying hospital linen. 13. There is no storage at the hospital. 14. Some of the cots in the wards are of iron, and some are wooden boards upon tressels; but no improvement is required in them for native soldiers. 15. The kitchen is a small building in the rear of the hospital arranged after the native fashion of cook-houses. The native soldiers either cook their own meals, or it is done for them by their friends, and never interfered with, save to restrict them, when necessary, to certain diets. 16. Native soldiers are not dieted; they provide their own food. 17. The hospital attendants for native troops is one hospital havildar; and orderly comrades are allowed to such patients as the surgeon may deem necessary. The attendance is quite sufficient. 18, 19, 20. No reply to these queries. 21. The families of the native soldiers are not treated by the regimental medical officers, except at their own request; and they are then visited in their own lines. Native soldiers prefer to have their families treated by their own native doctors. 22. There are no special local hospital regulations. 23, 24. No replies to these queries.
XIII. Burial of the Dead.	1, 2. The British burial ground is situate in the middle of the station. The subsoil is very rocky, rendering it extremely difficult to dig a grave of sufficient depth. 3. No regulations exist as to the grave space or the interval between the graves. They are six feet deep, and never re-open, and not more than one body is interred in the same grave. Interment is compulsory, at ordinary times, within 24 hours after death; and during epidemics almost immediately. 4. The grave yard is not generally offensive; but during seasons of epidemics, when deaths are frequent, it has been so. Quicklime is used to prevent nuisance when necessary. 5. The dead of the camp followers and bazaar people are interred in a burial ground about half a mile from the station. 6, 7. Injury to the public health does not generally accrue from the present practice; no improvements can be suggested in the way of regulation, or otherwise, in the disposal or burial of the dead.

(Signed) JOHN GALWEY, Lieutenant-Colonel, Commanding at Kurnool.
JAMES RATTON, Surgeon.
T. BECKLEY, Lieutenant, District Engineer.

31st July 1860.

MERCARA.

Accommodation:—Native Troops, Infantry, 1 Regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the surrounding country is hilly. Some of the hills are covered with wood, some are naturally bare, while others have been cleared and are planted with young coffee trees. There are many streams, several of which have been dammed up, and small tanks formed. There is a small square tank in the valley, immediately below the fort, and a large well inside the fort, together with numerous wells in the regimental lines. 2. The elevation of the station above the sea is said to be 4,500 feet, and about 1,200 feet above the table land of Mysore. I have no instruments, either public or private, to enable me to ascertain the exact height. The average height of the station barometer at 10 a.m. since my arrival here has been 26·6 inches, and the thermometer 72°. There are higher hills on every side of the fort, and several of them command it at short distances. The fort is healthy, and the hills in the neighbourhood have no particular advantage over that on which the fort is built, excepting for defence. On the neighbouring hills there is a want of water. 3. There is higher ground three-quarters of a mile from the station, and raised about 150 feet above it. 4. The sea is between 40 and 50 miles off as the crow flies, and about 70 by the road. There is a considerable river, about five miles from the fort, which flows into the Cauvery four miles on this side of Fraserpett. Smaller streams abound on all sides, but are not liable to overflow in the neighbourhood of the station. There are ravines near the station, but I do not consider them prejudicial to health. 5. The ground in the immediate neighbourhood of the fort falls on all sides, and the fort is itself airy and well ventilated. This is the hot season, and I have never seen the thermometer in the house higher than 75° Fahrenheit, seldom so high, and the mornings are generally cold in the shade even at this season. There are no buildings near to affect the tempe-

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	rafure. The station is exposed to every wind that blows. The sea-breeze is distinctly felt, and is beneficial to health. The east wind is dreaded as parching and destroying young trees, but I have not heard of its being unhealthy. 6. The hills are here and there being cleared for coffee planting. Almost every valley is artificially irrigated by the Coorgs for rice fields, but this is not likely to make the place unhealthy. There is no prohibition as to the cultivation of rice, nor is any needed. Neither indigo, hemp, nor flax is grown here. 7. There is no large city or town in the vicinity of the station. Mercara consists of two parallel streets of about half a mile long. The houses are tiled and thatched, and many of them only occupied on the day of the weekly market, their owners habitually residing in the country. The population is about a thousand. 8. The fort of Mercara is old, and the present palace has been occupied for more than 50 years. There is no regular station, but there are a few houses built within the last few years by the superintendent of Coorg, the clergyman, and some planters. The sepoy huts were built on new ground near the fort when Coorg was annexed. 9. Water is usually found, in the dry season, in the fort well, at a depth of 40 feet. In the regimental lines immediately below the fort the springs well out from the sides of the valley, and when they overflow run into a stream flowing through its centre. I have had no experience of the rainy season as yet. 10. The rain-fall, or water from surface springs, flows readily away. No drainage from elsewhere can affect the fort, and the lines are naturally drained into the stream flowing through the centre, which itself flows rapidly away. 11. The water supply of the station is derived from the numerous streams and wells already referred to. There is but one little tank in the neighbourhood, about 20 feet square. It contains neither plants nor animals and is not used for bathing. Small mud walls are now being built round the well-heads to prevent leaves and other matter falling into them. There is no nuisance from tanks. 12. The water supply available at this station is unbounded. The water is pure, clear, and pleasant to the taste, but I cannot state its chemical composition. The water is drawn from the well in the fort by a bucket and rope by those who require it. No better supply is required. 13. I have no other topographical points bearing on the health of the station to notice. The place is always considered very healthy, but my experience of it, as yet, is limited to two months. 14. New stations are selected by committees held by order or in the presence of sometimes the commander-in-chief and sometimes the officer commanding the division, assisted by medical officers as advisers. This practice has obtained only of late years. Many of the old stations were selected by some officer in command on the spot at the time. The sites of the old stations, in my opinion, are, for the most part, ill chosen. I can suggest no better mode than the present one for conducting this service.
II. Climate.	1. The only instruments, the property of Government, available at this station for meteorological observations are, a Newman's portable barometer, a standard thermometer, and a rain gauge. 2. There are no meteorological registers here, and I have been at Mercara but two months. 3. The climate of Mercara is excellent. This is the hottest season of the year. The thermometer (a well tested one) occasionally falls to 62° Fahrenheit just before sunrise in the open air, and rises as high as 76° during the day in the shade. 76° is the very highest, and it is rarely up to 75°. For six months of the year it rains heavily, and fires are needed for comfort; but the roads are dusty whenever rain is long withheld. The soil of the country naturally is, where not forest, covered with grass. The place is generally healthy, though there have been slight cases of diarrhœa among the troops. The men live in small thatched huts, most of them very unsuited for the monsoon months, when the climate is wet and cold; the men are, however, unable to remedy this. They only get two rupees hutting money, and on this pay, from the great rise in the prices of the necessaries of life of late years, it is as much as they can do to live. They live principally on rice, dried fish, and vegetables, being rarely able to afford to eat meat. Their clothing is good but insufficient, as they only get one woollen garment, tunic or trousers, annually, and they takee very opportunity, when they can afford it, of buying second-hand woollen clothing. Their drill is not injurious to health. The natives of the country consider the present season (April and May) to be the most unhealthy. Bowel complaints and fevers are the most prevalent ailments, but epidemics are almost unknown. The villages and towns are very small, the people preferring to live in detached cottages on their own farms, and this may account for disease not spreading. 4. Mercara is considered the healthiest place in Coorg, being open and free from the immediate neighbourhood of jungle. 5. The following are the stations at which I have served: Penang, Malacca, Singapore, Trichinopoly, Vellore, Kamptee, Secunderabad, Cuddapah, Bellary, Sholapore, Jaulnah, Madras, Rangoon, and lastly Mercara. The climate in the Straits is not unhealthy for Europeans, though relaxing, but the sepoys there, as well as at Rangoon, were not healthy; they suffered from dysentery, ulcers, and beri-beri. All the other stations, according to my experience, were at times healthy, at other times very much the reverse, and at all of them excepting Mercara I have known very severe visitations of cholera. Cuddapah and Sholapore I consider as most trying to Europeans; Secunderabad, Jaulnah, Madras, and Mercara the most favourable, especially the last-named place. The only objection to it is, the long and very heavy rains, which sometimes enforce confinement to the house for many days together.
III. Sanitary Condition of Station.	1, 2, 3. There is no engineer officer or draughtsman at Mercara. 4. The native troops live in huts, their own property. There is but one small barrack for Europeans (now vacant), formerly occupied by a detachment of artillery. The barrack rooms are 93 feet by 21 feet wide, with verandahs 10 feet wide. There are no Europeans, excepting the two staff serjeants, now at Mercara.

MERCARA.
MADRAS.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	TABLE of BARRACK ACCOMMODATION. Date of construction, 1841. Total number of rooms:—1 barrack room, 4 serjeants' quarters, 1 cook-room, and 2 privies. Total regulation number of non-commissioned officers, 4; of men, 24.

Barrack Room.	Regulation Number of Men in Room.	Dimensions of Room.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
1	24	Ft. 93	Ft. 21	Ft. In. 17 6	—	—	—	Ft. 2 Beds are in the Native Hospital.	7 and 6 doors.	Ft. In. 4 11	Ft. In. 4 3

5. The windows are on both sides of the barrack room, and there is a verandah on each side 10 feet 6 inches wide. The barrack room is unoccupied. The windows are of glass.
6. With respect to beds, bedding, &c., there is no Government property in use here, excepting in the hospital. The native soldier provides for himself as he can in every way.
7. The tents are of double cotton cloth, supported by two bamboo poles and a bamboo ridge pole. The length between the poles is 9 feet 6 inches; length on the ground, 22 feet; breadth at widest part, 13 feet; and height under ridge pole, 10 feet.
8. Ventilation is effected by the ordinary doors and windows, and this is sufficient to keep the air pure by night as well as by day. Artificial ventilation, such as by punkahs, is never needed, the climate being cool all the year round.
9. The artillery barrack room is of brick and chunam, with tiled roof; as are the barracks of the 25th Native Infantry. The term barrack, as applied to a native corps, means the building in which the arms are kept, not to the dwelling of the soldiers.
10. At Mercara the floors of the barracks are of wood, raised about one foot above the ground, but there is no passage of air beneath.
11. The barracks are constructed of brick and chunam, and the tents of double cotton cloth. These materials are good and suited to the climate. The men's huts are built of mud, and if rain is long continued, with wind, and the wall unprotected by matting outside, the hut often falls. I have no doubt that the sepoys would be less liable to illness than they now are if better housed. I can only suggest the expensive remedy of having brick and chunam lines built for them by Government, such as (with a few modifications) the regiment occupied at Perambore, Madras. The barracks and cantonment are kept in repair by the Department of Public Works. Repairs are not speedily executed, and it is with difficulty, and only after repeated application, I can get anything done. I consider myself responsible for the general sanitary state of the cantonment as commanding officer. There is only a native overseer of the Department of Public Works, and there is a difficulty in procuring bricklayers.
12, 13. There are no lavatories or cook-houses at Mercara. The sepoys employ dhobies, one to each company, who wash their clothes in the ordinary native way, beating them against stones by the side of a tank or stream.
14. There are no privies or urinals at present at this station; but I have applied for sanction to build three public necessaries in the lines for the use of the men and women of the corps. This sanction, however, I have not as yet received.
15. There is no artificial ventilation required in the barracks (place of arms), which is shut up at night; but there is a light in the guard-room.
16. There are no arrangements for draining and sewering the barrack. All refuse water flows readily away from in and about the fort. No part of any of the buildings is damp. The refuse, fluid and solid, from the hospital privy flows into a cesspool, at present under repair, and the only one in the place. From all other buildings the refuse is carried away by toties or sweepers twice a day. The hospital cesspool is 5 feet square, and is not near any tank or well. It is within 15 feet of the hospital, and open as it now is, while under repair, I consider the smell injurious to the health of the patients. I have written to hurry the work. It is intended to be covered over permanently. There are no foul ditches near the station.
17. The surface cleansing of the cantonment is not efficiently done, nor have I at present the means of satisfactorily removing the rubbish, &c., which so constantly accumulates. I have applied for two scavenger carts with coolies, but I have not yet received the sanction for their entertainment.
18. There is only a short close turf in the immediate neighbourhood of the cantonment; and no old walls, thick hedges, &c., exist to interfere with the ventilation of the station, bazaar, &c.
19. The bazaar is well ventilated, drained, and kept clean. There is an abundance of water, and it is not unduly crowded. The regimental cutwal and peons are held responsible for the cleanliness of the bazaar. Each shopkeeper keeps the street in front of his house clean. The natives near the station keep their cottages very neat and clean, and the town of Mercara is especially so. No nuisance is experienced in the cantonment from wind blowing over the native dwellings.
20. Sheep are killed a quarter of a mile from the fort, close to Mercara town. No regulations are required, the number being so small, and no nuisance is ever experienced from this cause. Beef is killed at Fraserpett, 20 miles from Mercara, and only one animal in two months. A condition was made at the time of the annexation of Coorg, that cows should not be killed in the country. Why, I know not, as the Coorgs will eat anything they can get. They do not themselves kill cows, but appear indifferent on the score of the beef brought from Fraserpett to Mercara.
21. There are only the horses of the officers of the regiment and a very few ponies here.
22. There are no artillery or cavalry stables, or ground for picketing horses, at Mercara.
23. The only quarters for married non-commissioned officers are those of the two staff serjeants attached to the 25th Regiment. These quarters are good and sufficient.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.* *Officers' Quarters.*	1. There are no officers' quarters at Mercara, as most of the officers reside in the old palace of the ex-rajah. No improvements to suggest.
IV. Health of the Troops.	1. The station, district, and native population are healthy. 2. Epidemics are scarcely known here. Fever and bowel complaints chiefly prevail. 3. I attribute the healthiness of the neighbouring native population to good air, good water, and the cool and equable temperature of the station. 4. The troops before arriving at this station were at Madras for 2 years and 6 months, and commenced to march to Mercara on the 23rd February 1860. The corps was generally healthy while at Madras, and the principal diseases were fever, diarrhœa, rheumatism, and skin disease. The regiment reached Mercara on the 20th March 1860, generally in good health. Fever and diarrhœa have been the diseases most prevalent since their arrival. No part of the men's present accommodation is more healthy than the rest. 5. Troops at this station are not camped out. 6, 7. I have not before been at a hill station with troops, so cannot answer these queries. 8. I have had no opportunity as yet of forming an exact opinion, but judging from my own feelings, as well as from the preference (when once acclimatized) which native servants evince for hill stations, I should highly approve of them as stations for troops. There are a number of pensioners (natives) who once belonged to regiments stationed here, now settled in and about Mercara. These men are in no way originally belonging to Coorg, but those I have asked about it say they like the climate, and find themselves enabled to do more work here than they could in the plains. 9. Troops often suffer from bowel complaints more or less severe on first going to hill stations, as well as from coughs, colds, and fevers. 10. The natives should be better clothed, fed, and housed than they can at present afford to be. When off duty they wear their native dress, generally of cotton cloth, unless some second-hand woollen garment has been purchased cheaply. Their exercises are never prejudicial to health. 11. Here the rainy season from the end of May up to September is the least agreeable, but it is considered healthy. The least healthy months, according to the native opinion, are May and September, the beginning and end of the monsoon. I should say that a residence of not less than one year would be the shortest to enable troops to receive the benefit of hill stations. 12. There is no period of service in the hills beyond which injury is likely to be inflicted on the health of the troops, on returning to service in the plains. 13. I do not think that any special precautions are required for preserving health on leaving hill stations for the plains. 14. In my opinion (and from personal experience, for I have been more than once on the hills though not with troops) I should say the troops would be much stronger and better able for occasional work in the plains if permanently located on the hills. A short visit to the hills is not of much use. Frequent change of station in the plains is, I think, beneficial, but changes are dreaded by the native troops, on account of the great expense they incur in providing carriage for their families. 15. The only barracks at hill stations which I have seen are the Wellington (Jackatalla) barracks; but they were not at the time finished. 16. From 4,000 to 6,000 feet above the sea is the elevation most suitable for sites for hill stations. 17. There is an abundance of available ground in this neighbourhood for hill stations, but all about the same height. The hills in the vicinity have no table land of any extent; some are 6,000 feet above the sea. The station would not, I think, be a favourite one with convalescents on account of the long continued rainy season, six months in duration, and very gloomy as well as wet. 18. I have always considered, from my experience, a reddish gravelly soil to be healthy, and the black cotton soil the reverse. 19. I consider the best age for soldiers to proceed to India to be from 18 and 19 years and upwards to 25, and the best period for them to land there, November. They have then moderately cool weather up to March, and are in these months gradually broken in for the endurance of the hot season. 20 to 23. No replies to these queries. 24. Invalids leaving India for home should, if proceeding by sea, leave in December, but if by overland route in March. They should not arrive at home until the spring was somewhat advanced.
Diseases.	1. There are no regular medical inspection parades at this station. 2. No case of scorbutus has occurred among the troops at this station. 3. Cases of hepatic disease are very rare at Mercara. 4. Dracunculus is said to be unknown in Coorg. Some cases were admitted into hospital on the march previous to, and three more since arrival here. The cause of this disease is unknown. Probably it arises from washing in the muddy nearly dried up tanks on the road from Madras. 5. The proportion which venereal diseases bear to the total sick in hospital is about 3 to 20. 6. The troops at this station suffer from fever (intermittent), diarrhœa, and rheumatism, but there have been no deaths since the regiment arrived here, *i.e.*, on the 26th March 1860. 7 to 10. No experience to enable me to answer these queries.
V. Intemperance.	1. The soldiers at this station are usually temperate. Some of the sepoys occasionally drink, and if found out are punished. Drinking is less prevalent here than it was at Madras or in Burmah. There are no confirmed drunkards at present here. Advantage was taken of the late reduction in the native army to get rid as far as possible of the men inclined to drinking. 2. Drunkenness is always punished as an offence. 3. Distilled spirits are sold in the bazaar in shops licensed by the Abkaree contractor. There is no canteen in native corps. 4 to 11. No replies to these queries.
VI. Diet.	No information under this head; the questions applying to European troops.

MERCARA.
MADRAS.

References to Subjects and Queries.	REPLIES.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements are as follow:—Tunic and trousers of woollen cloth, varnished wicker turban, sandals, white stock, haversack, cross and waist belts, pouch, and cap pouch. Of these the accoutrements, tunic, and trousers are supplied to the sepoy by Government, and he provides himself with all the other articles, as well as with his undress clothes. They are made according to a pattern by the quartermaster, and the amount stopped from his pay by instalments. Woollen clothes are suitable for the climate of this station for the greater part of the year. The sepoy cannot afford to buy a sufficiently warm mufti dress; a woollen boat cloak of regimental pattern is supplied to him, for which he has to pay. For the plains the sepoy should have a loose khakee dress, blouse and baggy trousers tightened at the ankle, with a cloth turban. Their present woollen clothes are sufficient for all night work in South India, hill or plain. The sepoys do not like boots for ordinary use, and they say they hurt their feet, as they cannot afford to keep a supply of stockings. They wear their tunic and black trousers, cloth or woollen, when on guard. If possible, they are posted under shelter, but are often necessarily in the open air. There is always a sentry-box or verandah in case of rain.
Duties.	1. No answer to this query. 2. Drill goes on at all seasons, but there is less during the rains and the very hottest weather. Drills generally take place in the morning, occasionally in the evening, and rarely for more than an hour or an hour and a half at a time. It does not affect health injuriously. Morning is the best time for drills to take place. The average number of nights the men have in bed at this station is four at present. 3. Guards are mounted in the Palace Square close to the barracks, and are relieved every 24 hours; the sentries every 2 hours. There is only one roll call at this station daily at 5 p.m. I cannot say that night duties particularly affect the health, though they may occasionally induce slight colds and fevers.
VIII. INSTRUCTION AND RECREATION.	No information under this head.
IX. MILITARY PRISONS.	1. There is no military prison, but a prisoners' room at the main guard, and two cells, which are sufficiently good.
X. FIELD SERVICE.	1. I have not heard of any special local regulations for field medical service not included in the general presidency regulations. 2. With regard to the conduct of the line of march, camping, &c. &c., the quartermaster of a native corps goes on in advance and selects the ground; but should either the medical or commanding officer object to it, it is changed. 3. High sloping ground on gravelly soil is selected if possible for camping grounds, due regard being had to the water supply available. Running streams are preferred, and the water is supplied to the tents by puckallies. Ground which has been irrigated, low ground, and black cotton soil, are avoided as far as possible. Should the medical officer not be satisfied he suggests removal or any other remedy. 4. For the transport of sick and hospital supplies on a line of march doolies and sick carts are supplied to native corps according to the strength of the regiment. The sick cart at present in use is a most uncomfortable conveyance. The hospital supplies are carried by coolies and bearers.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head is afforded.
XII. HOSPITALS.	1. There is no engineer officer or draughtsman at this station. 2. The hospital is outside the fort on the south side, and about 20 yards from it. It is on a ledge slightly lower than the fort, and the sepoy lines are in front of it lower still. The town of Mercara is on the north side of the fort, about a quarter of a mile from the hospital. The hospital is sheltered from the north wind by the fort, but is open to every other wind that blows. It is freely ventilated, and the site generally is healthy as regards elevation, drainage, &c. 3. The supply of water is abundant and wholesome. 4. Close to the hospital privy a large cesspool has been built (not finished yet) of brick and chunam, with a covered drain into it for all impurities. This is to be permanently covered, but I cannot say how it will answer. Ordinary surface water drains off immediately, the ground sloping off to three sides. 5. The lowest ward is raised about six inches from the ground, but there is no perflation of air beneath the floors. The roof water readily flows off the site of the building, and the surface drainage and guttering round the hospital is quite sufficient for carrying away the rainfall rapidly. The hospital is built of brick and chunam, the walls and roof are single, and it is always cool. It is supplied with verandahs on both sides 10 feet wide, and these afford sufficient shelter from the sun's rays, but are never used for the accommodation of sick, convalescents, or others. The hospital is a building on a ground-floor.

TABLE OF HOSPITAL ACCOMMODATION:—
Date of construction, 1841.
Total number of wards, 2.

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.				Ft.	Ft.	Ft. In.	Ft. In.
1	No regulations.	36	21	16	—	—	—	2	5	4 11	4 3
1	Do.	82	22	16	—	—	—	2	14	4 11	4 3

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The breadth of the verandah is 10 feet 3 inches. The distance of the privy from the hospital is 15 feet. The hospital is open to all winds but the north. The windows are sufficiently numerous for light, ventilation, and coolness. 6. No artificial means of ventilation are required, such as punkahs or thermantidotes. The jhilmils are of the ordinary Venetian construction. 7. There are no means in use for cooling the air admitted into the wards. 8. There is a fire-place at each end of each ward. The walls and ceilings of the wards are cleansed and limewashed annually, or whenever the medical or commanding officers apply to have it done. 9. The privy is on the east side of the hospital, and close to it. It is too small, and under the same roof is a small room said to be a cook-room for the patients, but which I have forbidden to be used as such; the smell from the privy in the latter room is most offensive. Both rooms should be used as privies, as there is a cook-room at the west side of the hospital. Water is daily thrown into the privies, which drains into the cesspool. This latter at present being under repair is very offensive. 10, 11. There is no special lavatory for native sick. The patients wash in the open air according to their custom, or are permitted to return to their own huts for the purposes of ablution. There are, however, several bathing tubs for the use of the sick. 12. The washing and drying of the hospital linen is done by dhobies. 13. The storage is sufficient and dry. 14. The bedsteads used in the hospital are made of wood with tape supports. 15 to 24. No replies to these queries.
XIII. Burial of the Dead.	1. The burial-ground used for the British troops is half a mile south of the palace, and to leeward of the prevailing winds. 2. Its area is 85 yards by 45 yards. The ground is carefully kept, and the place is well drained. Its soil is of a reddish gravelly clay. 3. Only the European residents who may die here are buried in the cemetery. The graves are very few in number, and I am not aware of any regulations regarding grave space, &c. In India generally interment takes place within 24 hours after death; but here such early interment might not be necessary. There are several native grave-yards at various distances from each other, but I am not aware of any regulations being in force respecting them. 4. The grave-yard for the British troops is never offensive. No one has been buried in it since I have been here. 5. The dead of camp followers are either burnt or buried, according to caste. 6, 7. No injury accrues to the public health from the present practice, nor are any improvements to be suggested in the mode of disposal of the dead.

(Signed) George Halpin, Lieut.-Colonel,
Commanding 25th Regiment Native Infantry
and Mercara.

H. Goodall, Surgeon, in Medical Charge of
25th Regiment Native Infantry.
There is no Engineer officer at Mercara.

12th May 1860.

SAMULCOTTAH.

Accommodation.—Native Troops. Infantry, 1st extra Regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. To the north of the station there is a fertile valley, varying from 8 to 12 miles in width bounded by a hill range; to the east, a broad flat (about 8 miles) bounded by the sea; to the south, the delta of the Godavery, and to the west, low jungly hills. The surrounding country is varied in character, as above. To the north-east and south it is, for the most part of the year, under water or swamp. To the west it is very dry, and the land is poor, without much sand or dust. There is abundance of wood with fine trees in the valley to the north, without any dense or uncleared jungle, but scarcely any wood to the east and south, which, towards the west, is of a stunted shrubby character. The irrigation canals of Godavery are on the south side, and a small river, supplying the country, to the north and east. 2. The station is situated on rising ground, the lines of the regiment and families of other regiments being from 20 to 40 feet above the lowest ground in the station. The lower end of the cantonment has an elevation of nearly 50 feet above the sea, and of 20 to 30 feet above the adjacent country to the north-east and south. The nearest river has a branch which runs near the lower end of the cantonment, and bounds it on the east; but this is dry for eight or nine months of the year. The Samulcottah and Cocanada canal is distant one mile to the south-east. There is higher and healthier ground within 1½ miles of the station. An easy, gradual ascent leads to a small table of land, above one mile in circumference, and elevated more than 100 feet above Samulcottah; it is well adapted for military purposes. This ground is stony and dry, contains any required quantity of stone for building, possesses one small tank which never dries up, while another could easily be made which would contain an inexhaustible supply of water (about 12,000,000 gallons). The air is 3° or 4° cooler a.m. and p.m. than in the cantonment, and good roads could easily be made to the country below, to which there is gradual descent all around. 3. The range of hills to the north is distant about 12 miles (direct). The hills vary much in elevation; the highest is near Dhumaverim, and rises about 1,600 feet above Samulcottah.

Samulcottah. Madras.	References to Subjects and Queries.	Replies.
	I. Topography—*cont.*	4. The nearest river is that which waters the valley to the north, above two miles distant, and a small branch, filled only in the rains, runs near the lower end of the station. The sea (Bay of Bengal) at its nearest is distant fully six miles. There is no overflow of the country in the vicinity of the station further than that purposely allowed for irrigation. The land so irrigated is never dry, except towards the close of the hot weather. There are no broken ground, ravines, water-pits, &c., dangerous to or affecting the health of the station. 5. The station is freely exposed to the winds; but unfortunately a large native town, with bazaars and enclosures for hundreds of cattle, &c. &c., has been allowed to grow up on its south and south-east aspects, and the regimental and garrison lines have been built on the south-west, so that the prevailing winds carry impurity and contamination into the chief parts of the cantonments for nine months of the year. The temperature of the station is only slightly raised by the buildings being exposed to reflected sun heat. The station is not exposed to cold or variable winds, the coldest being the north, which is seldom felt. The north-east and east sea-breezes prevail from 1st October to January, the south-east and south winds from January to May, and land winds south-west and west by south from May to September. All these winds are healthy, but from the impurities and contaminations before mentioned. 6. The surrounding country for the most part is well cultivated on the north, south, and east sides, but barren for the most part on the west. There is the irrigation from the Godavery on the south and south-east aspects. The river above spoken of supplies the country to the north and east. This irrigation is close to the station, except on the south side, where the country is stony and dry to the distance of three or four miles. No appreciable effect on the health of the station, as far as can be observed, is produced by this irrigation; but the climate is cooler in consequence. The cultivation of rice in the surrounding country is not, I believe, at all prohibited. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The native town is supposed to contain a population of about 8,000 or 10,000. It is divided into two chief portions (Samulcottah and Bemarum), and extends from the south and south-east borders of the station to the canal. 8. The super soil of the upper part of the station and high ground consists of a thick yellowish brown clay mixed with small pebbles and the debris of rocks. This varies from four to eight feet in depth, and beneath is a stratum of hard somewhat friable stone, from two to eight feet in thickness, which rests on a bed of clay-stone about three feet thick (and this on yellowish sandstone). The soil of the adjacent country to the north-east and south is the alluvial, brought by the Godavery and the smaller river from hills on the north side, and near the coast it becomes very sandy and barren. The station is built on the site of an old fort. 9. In the lower part of the cantonment water is found at a depth of from 12 to 20 feet in the dry season, and rises to the surface in the wells during the rainy season. The further up the hill, the greater of course the depth to be sunk. 10. The rain-fall and water from surface springs flow readily away, not sinking at all into the subsoil. The water lies on the surface on the high ground before mentioned, in holes scooped out or natural hollows, and the only loss is by evaporation or by the drinking of animals. That flow of water which descends from the higher ground adjacent runs through the cantonment rapidly, leaving the ground dry within half an hour of a heavy rain. 11. The water supply of the station is derived chiefly from a tank lying between the lines and the officers' houses, and which is fed mainly by rains. This percolates into many of the wells, and so affords good drinking water. The sepoys use the water directly from this tank, which is the only one which does not dry up, not being used for irrigation purposes. It has a surface, at ordinary depth or fullness, of about 28,500 square yards. This tank is more or less full as the monsoons of south-west or north-east are heavy or light. In 1857 after a heavy fall in October, it was full; in 1859 it was never half full, and now (March 1860 it is very low. The said tank contains fish and gradually increasing vegetation, but of their nature I cannot speak. No tank used for drinking purposes is also used for bathing. A considerable quantity of leaves are blown into the tank from the trees around. One of the chief feeders of the tank runs down through the regimental lines, and must always bring considerable quantities of impurity with it. Just without the cantonment, bordering the regimental and garrison lines on their south and east face respectively, is a large belt of prickly pear very high, and cut out into open places used as privies. This is a very great nuisance, of large extent, and likely to be provocative of cholera or typhus. The prickly pear should all be cut down and the ground cleared. No nuisance arises from any tank. 12. The water of the tank above mentioned, used by the sepoys, &c., is soft and insipid, with a flavour and taste of decaying vegetation (not strong), and tolerably clear in the dry season, but very muddy after the rains. The water of the bowries or wells in the cantonment near the officers' houses is harder water, though not hard, free of taste and smell, and perfectly clear except after very heavy rains. Some of the wells are not used for drinking or cooking purposes, as they contain apparently much saltpetre and other salts. There are no means, apparatus, or proper tests available at this station for giving a correct analysis either as regards the quality or quantity of the water. The water contains chloride of sodium, and small quantities of nitrate of potass, and probably of other nitrates. No peculiarities are observable under a microscopic power of 20,000. The quality of the water is not injurious to health (for India, good), and it is generally very abundant. It is raised from the wells by the ordinary leather bucket or palmyra leaf. The supply for the tank could be obtained pure by using covered aqueducts of brick through the lines from the high ground above, not allowing any drainage to enter these, and could be kept pure by cleaning the banks of the tank, by clearing out its present bed, and by sinking deep bowries from the latter in various parts. 13. No reply to this query. 14. I have no personal experience as to the amount or kind of inquiry made before new stations are finally selected.
	II. Climate.	1. Thermometers belonging to the medical officer were used in part of 1857-58-59, but are all broken. A rain gauge, still in use, was received from the collector of the district in July 1858. No other meteorological instruments are available at this station.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	2. From the absence of a complete set of meteorological instruments, and perfect means of conducting and registering observations, the following table must be taken as approximative only, but very nearly so.

Table of Meteorological Observations from December 12th, 1857, to March 25th, 1859.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Maximum Dry Bulb, Day.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds.		Days of Sunshine.	Remarks.
										Direction.	Force.		
		°	°	°	°	°							
January -	—	70	21	78	55	80	—	—	None.	N.E., E., S.E.	Moderate.	31	Heavy dew early morning and evening; almost no clouds.
February -	—	76	25	82·5	60	84	—	—	None.	E. & S.E.	Do.	28	Do. do.
March -	—	80	21	88	65	87	—	—	1·0	S.E., S., & S.W.	Do.	29	No dew; very little cloud usually.
April -	—	85	20	92	75	94	—	—	2·5	Do.	Do.	22	Sea breezes occasionally from E.; land winds occasionally from W.; no dew; seldom storms.
May - -	—	85	18	95	80	96	—	—	1·0	S., S.W., W.	Moderate and strong.	24	Do. squalls occasionally from N.W., with clouds of dust and falls of rain; thunder.
June - -	—	80	15	90	78	92	—	—	6·1	S.W., W.	High winds and monsoon.	18	No loud thunder; heavy showers.
July - -	—	79	10	85	78	86	—	—	10·0	Do.	Moderate.	14	Do.; no very heavy falls.
August -	—	79	8	85	77	87	—	—	6·45	Do.	Do.	17	Do. do.; more sunshine generally than in July.
September	—	77	9·5	85	76	85	—	—	5·55	Shifting.	Moderate and calms.	21	Very calm month generally, with often light drizzling rains.
October -	—	73	9	83	74	84	—	—	9·73	N., N.E.	Monsoon and gales.	25	Heavy rains and storms of wind with N.E. monsoon.
November	—	69	13	86	63	81	—	—	None.	N.E.	Moderate.	30	Fine clear weather; cool.
December -	—	68	20	78	53	78	—	—	0·5	N.E.	Do.	28	Do. do.

3. I am of opinion that Samulcottah has (for the plains of India) a most healthy clima moderately dry for eight months of the year, and moderately damp for the remaining fo months. Unless for a few days before the south-west monsoon, there is no excessive he and for four months (from November to March) the temperature is delightful. There w hot wind in 1858 for nearly four weeks, but none in 1856, 1857, or 1859. The only impur that affects the station is that named in Question 5, "Topography," and this does not aff the high ground above the cantonment at all. The health of the troops is, on the whc very good, and the few Europeans here are quite healthy. One child of the latter, fo weeks old, has died, but from a cause not connected with the climate, and this is the or death among about 50 Europeans since the arrival of the 1st extra regiment here in D cember 1857. The least healthy months appear to be September and October, for Europea and November and December for the natives. Boils, slight rheumatic affections, and di rhœa attacking the former, and colds, rheumatism, diarrhœa, dysentery, and ague seizi upon the natives in the cold months.

4. There is no more eligible place near this station, except the high ground before mention in Query 2, "Topography." Its advantages have been briefly enumerated, and, in additio one may be mentioned connected with its choice as a site for a depôt for European soldie viz., it is within one mile of the canal which could afford conveyance for any number of m in a few hours, to Cocanada, where is the only port on this side of India at which troo can be embarked or disembarked for emergent service in any ordinary state of the weath No reason exists against the adoption of this site for such a depôt.

5. The following is a list of stations at which I have served:—Madras, Bangalore, Bella Labuan, French rocks, Ellicpore, Masulipatam, and Samulcottah, in the order written. consider Labuan and Ellicpore stations, of these named, the only unhealthy ones. Labu was deadly from 1846 to 1851, and was then chiefly unhealthy from a never-failing, da gerous fever in event of exposure to its causes. The island now, I believe, is more health In 1850 the deaths to strength of troops were 10 per cent.; in 1851 (my term of servic about 3 per cent. Ellicpore is only unhealthy from the beginning of the south-we monsoon in June till towards the end of November, but is, during that period, productive diarrhœa, dysentery, &c., and the worst form of remittent fever. Bangalore and Samulcotti I look upon as those most conducive to health.

III. Sanitary Condition of Station.

1, 2. Plans of the station and surrounding country are transmitted.
3, 4. There are no barracks at Samulcottah, merely a place of arms.
5 to 13. These questions are applicable solely to stations for European troops.
14, 15. There are no privies or urinals in general use with native regiments.
16. There are no foul ditches near the station.
17. No reply to this query.
18. The surface of the cantonment is kept generally free of vegetation; but there is a quanti of prickly pear on the south and south-east sides of the station, which might be removed wit advantage.
19. There is no bazaar of any importance here, nor any native houses sufficiently near to inter fere with the sanitary condition of the station.

SAMULCOTTAH. MADRAS.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	20. Animals for the use of the troops are slaughtered at a short distance from the native lines; but no nuisance is experienced therefrom. 21, 22. There are neither artillery nor cavalry located at this station. 23. No reply to this query.
Officers' Quarters.	There are no public quarters at this station.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining native population are very healthy. 2. The most prevalent diseases among the native population are small-pox, syphilis, and, at certain seasons, fever, chiefly of the intermittent type. Spleen disease occurs but seldom, in fact, I have not seen a case. 3. The healthiness of Samulcottah and its neighbourhood is chiefly to be attributed to the well-cleared, well-cultivated country around, the almost entire absence of malarious marshes or swamps, the perfect ventilation from the fresh sea-breezes, and the very generally well-to-do state of the labouring population, who have abundant employment and double the pay they could secure a few years ago. 4. This first extra regiment was raised partly at Masulipatam, where the 400 or 450 men composing it resided for about three months prior to coming to Samulcottah. They left Masulipatam on the 8th and 12th of November 1857, in wings, arriving here (viâ Coconada by steam) in two days. The men have suffered very little from sickness at any time and are very healthy now. There is no portion of the men's present accommodation more healthy than the rest. 5. The troops at this station have not been camped out. 6. I have been in charge of troops at Bangalore, which place is very healthy and well adapted for European soldiers; but from the coolness of the climate, the men take liberties and expose themselves, &c., the sufferings consequent on which irregularities are often erroneously ascribed to location and climate. 7. I have had no opportunities for observing whether troops who have been resident for some time on hill stations are more or less liable to attacks of febrile and other diseases on their return to the plains. 8. From my experience I think hill stations best adapted for Europeans, and stations of moderate elevation for natives. 9. There are diseases peculiar to hill stations, according to elevation. Europeans going from the plains of India to heights of above 5,000 feet are, if not very careful in clothing, &c., liable to diarrhœa, liver diseases, and other abdominal complaints; natives to diarrhœa, dysentery, bronchitis, rheumatism, and fever. 10. In hill stations in India precautions as regards diet, clothing, shelter, &c., should be as carefully attended to as in England, and more so after the men have had a hot season or two in the plains. The advantages, then, of a residence in hill stations to health are incalculable. 11. From my experience I am of opinion that the seasons best adapted for residence of troops in hill stations are,—first, from March till June; second, in certain stations (these not too humid) from July till November. After convalescence from illness on the plains, a period of two months is the shortest likely to be advantageous in restoring strength. After a long tour of duty in the plains, the men, Europeans, being debilitated and depressed, should be allowed to remain in a good hill station, two years, if possible, at least. 12. There is no period of residence in hill stations beyond which injury is likely to be inflicted on the health of troops on their return to service in the plains. 13. The precautions to be observed are not so great as on troops first landing in India. The great dangers to be avoided are, over-eating and over-drinking, especially of stimulants. 14. It is little to be doubted that, if European troops could be located "on hill stations with only short periods of service in the plains," they would be as healthy as at home, and as fit for active exertion. "Short periods of change to hill stations" are, however, greatly conducive to maintenance of strength, and exert an invigorating check on the perpetual waste of the plains of India. Frequent change of station in the plains is beneficial to health if these changes embrace moderate distances and avoid all unnecessary expense, otherwise the gain scarcely compensates for the fretfulness and irritation created in both Europeans and natives. 15. No answer to this question. 16. I have had no experience of ranges of elevation above 4,600 feet. From 1,800 to 4,500 feet of elevation give abundance of healthy sites for European troops in India, if the ground be properly cleared and all appreciable causes of disease be removed. 17. There is no higher ground near the station except that before mentioned. There is a hill called Bison Hill, about 2,000 feet above the sea, which has been spoken of as a sanitarium, near Rajahmundry, on the banks of the Godavery, but its effect upon health is as yet an experiment. 18. I have found a hard stony surface soil absorbing very little moisture, and allowing water rapidly to drain off, associated with a healthy unmalarious climate;—and a gaping porous black soil, rich in nitrates, existing with and apparently giving rise to a climate fruitful in malaria, fevers, diarrhœa, dysentery, &c. 19. I consider that from 20 to 24 years is the best age for soldiers to proceed to India, and they should land there from the beginning of November till the end of the year, or beginning of February. I would recommend that recruits on first landing in India be sent at once to learn their duties in a cool hill station, be kept as much as possible from temptation to drinking and other vices, encouraged to pursue their trade, or learn one in hours of leisure, and taught to avoid all unnecessary exposure to the sun, sleeping in draughts, sitting in wet clothes, under a punkah, near a wet tattie, &c. 20. I think it very desirable that troops destined for service in India should be sent first to the Cape of Good Hope, if only for a year or two. 21. The mode of transport to almost every station (inland) in this Presidency is by marching. The construction of good permanent roads, in the absence of railways and canals, to and between all stations, is of paramount importance.

References to Subjects and Queries.	Replies.
IV. Health of the Troops—*cont.*	22. A British soldier should not, if possible, serve longer in India than 10 or 12 years, if he is to prove an active useful soldier in any other country; the "morale," as well as the "physique," almost invariably undergoing progressive demoralization in the enervating atmosphere of India. 23. I think that the expressed opinion of a medical committee up country, as regards invaliding &c., should be considered final; and so all unnecessary delay, and all avoidable danger to the patients' health at the Presidencies, be removed. There is not often conflict of opinion at the station where any individual has resided, as his case is well known and understood, the reasons for invaliding (on sick certificate) being generally obvious to each member of the committee. 24. Invalids proceeding home by the Cape route should leave India in January, February, or March.
Diseases.	1. There is an inspection parade once a week for the sons of sepoys on foreign service, and on the pension establishment, over whom there was no other sufficient control, and who were found (in 1858) to be in a very filthy diseased state, unfit even for the light duties they were doing. There is now little disease, except among some late comers. 2. Scorbutic disease was what chiefly affected the above, and seemed to be brought on mainly from the continual use, as food, of dried and stinking fish, here very abundant. This disease attacks also some of the younger sepoys, who live in the same way; but it is speedily cured in hospital. The proportion which it bears to other diseases is very variable. I believe the disease to be caused entirely by the feeding on this foul fish, as those who do not partake of it do not suffer. 3. I have had only one case of hepatitis at this station in an European, brought on by exposure to night air in a boat after over-fatigue and excessive perspiration the day previous. Hepatitis sometimes follows peritonitis and dysentery; but is more often idiopathic, and is caused generally by chills when heated, or more gradually by too high living. Healthy, regular exercise, in addition to the measures shortly recommended in "Query 19, Health of Troops," will be most conducive to the warding off of this often insidious disease. 4. Dracunculus is observed chiefly in certain localities in each Presidency, and in those districts seems to commence chiefly, if not solely, from bathing and wading in the water of certain tanks. I have had two tedious cases of the disease here (natives) both in men who had immediately before been stationed together near Secunderabad. 5. I cannot give the proportion which the sick in hospital from venereal disease bear to the total sick from all other diseases for European corps. As in native corps, it varies according to the station, and the number of married men in each regiment. As preventive precautions, constant and profitable employment for the mind, as well as for the body, everything that tends to elevate the hopes and desires of the soldier, and the greater encouragement of marriage to European privates. 6. The following are the diseases from which the troops at this station suffer:— *Fevers.*—From continued fever, remittent and intermittent; but chiefly from the last of these. *Dysentery.*—Chiefly at the commencement of the cold weather. *Cholera.*—We have had only two cases of cholera among the followers in the garrison, and three in an adjacent village. All recovered but one, which was brought in extremis. *Small-pox.*—Very little prevails at this station. The men were all vaccinated in 1858, after which there were 19 cases, 15 very slight, and all modified. All recovered very favourably. *Rheumatism.*—The men suffer considerably from rheumatic attacks, sometimes very severe, and often obstinate. The following shows the proportions which admissions and deaths from the above diseases bear to the total admissions and deaths. Admissions in garrison hospital - - - - - 117 Total admissions in hospital in 1859; strength of regiment, 1,200 - 671 Total deaths - - - - - - 3 The admissions from fever were 194; from small-pox, 19; from rheumatism, 43; and from dysentery, 4; but no death from any of these diseases occurred. Of the three deaths one occurred from mercurial fever, contracted under native advice for cure of syphilis, one from beriberi, and one from pneumonia, arising during convalescence from a severe fever. Of garrison patients, strength varying from 200 to 400, admissions from fever, dysentery, small-pox, and rheumatism, were 17, 4, 1, and 6, respectively, but no deaths occurred. 7. There are no diseases peculiar to the district which present particular features of interest. It may be observed that small-pox is chiefly prevalent during the hot weather from March to May, and that fevers are most numerous after the rains in September and October. 8. No reply to this query. 9. Small doses of quinine as a prophylactic against malarial disease are not required at this station. 10. Vaccination is not carried out as it ought to be in the villages and neighbourhood. Vaccinators (native) are appointed to each district, or several to one district; but these are often careless, and without proper supervision almost never to be depended upon. The civil surgeon of Rajahmundry is, nominally, superintendent of vaccination, but has in reality no power; and if he had, the nature of his varied duties would make the superintendence of a district impossible. The only hope of preventing or mitigating the ravages of small-pox among the native population, and warding off contagion from our several stations, is to have a staff of properly-qualified vaccinators, responsible to and under the orders of an active superintendent of a district, or a division of the army, whose duty it would be to visit every station or village where a vaccinator resided, and personally to inquire into and examine the reported results.
V. Intemperance. VI. Diet.	No information on these heads, the questions referring solely to European troops.

SAMULCOTTAH. MADRAS.

References to Subjects and Queries.	Replies.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress consists of the following articles:—tunic, and woollen trousers in the cold season, and on sentry a cloak in addition at night. In hot weather a light tunic and black cotton trousers; boots at all times. The usual native pugree as a head-piece. Since the introduction of the tunic I consider the soldier is well and suitably clothed; but I should recommend the more general use of boots in the native army, against which there is no prejudice. The only other difficulty is the head-dress, against which there appears to be no remedy.
XII. HOSPITALS.	1. Plan of the hospital is transmitted.
	2. The garrison and regimental hospitals, under one roof, very low and ill-adapted in every way, are situated at the lower end of the cantonment, north side, and close to the officers' houses (on one side). The hospitals are not near the bazaar and houses of the native population, which are all on the south side. The site is open, well ventilated, and generally healthy, but in the event of Europeans being stationed here, and a new hospital built, it should be with the barracks on the high ground.
	3. The water supply is abundant and wholesome, and is at no great distance.
	4. All impurities are removed from the neighbourhood of the hospital by the toties of the establishment.
	5. The walls of the hospitals are not eight feet high; the roof is a sloping tiled one, but there is no ceiling; the floor is on the ground, and is not raised in any way. The roof-water runs rapidly off towards the water-course below, and does not settle nor sink into the subsoil. The surface drainage and guttering round about the hospital is sufficient for carrying away the rain-fall rapidly. The roof and walls of the hospitals are single, and the latter are built of country brick. There is a space for ventilation between the walls and the roof, but the latter is not sufficient to keep the hospital cool. There is a verandah, about five feet wide, on one side of the hospital, and a pandall (made with posts and leaves) on the other three sides, the former affording protection from the sun. The verandah is never used for the accommodation of sick, convalescents, or others. The hospital consists of one flat.

TABLE OF HOSPITAL ACCOMMODATION.

Date of construction, about 1780.

Total number of wards - - - - 2
Total regulation number of beds - - - 30

Wards, Number.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		Yds. ft. in.	Yds. ft. in.	Feet.	Yds. ft. in.			Ft. in.		Feet.	Ft. in.
Regimental No. 1	20 are at times in each,	15 2 6	6 2 4	8	2,575 1 8	386·36	48·32	1 6	6	4	3 6
Garrison No. 2	15 are enough.	15 2 2	5 0 7	8	1,960 0 0	294·00	35·41	1 6	5		

The hospital, considering the present site of the cantonment, is as well placed as it can be to receive the full benefit of prevailing winds. The windows are made of wood, and open inwards. They should be glazed; for if shut, there is darkness, and no ventilation; and if all open, they give free admission to the hot air.

6. The only means of ventilation are those above mentioned.

7. No answer to this question.

8. The walls and ceilings of the hospital wards are cleansed and limewashed once a month.

9. The privy is a small room, under the same roof as the dead-house. It is cleaned out by the toties of the hospital.

10, 11. There are no lavatory arrangements, and there is only one tub under the pandall on the east side for bathing the sick. It is exposed to the view and to the weather; I have recommended that it be enclosed. The means of bathing are neither sufficient nor convenient, and almost preclude the use of baths.

12. The washing and drying of hospital linen is done by the native dhobies or washermen.

13. A small centre room serves as a surgery, a store for medicine, and all other purposes. It is not sufficient in any way, nor is it dry in the monsoons.

14. The bedsteads used in hospital are of two kinds, iron and wood, with tape supports, both of which are sufficient for the purposes of a native hospital.

15. The kitchen, which is behind the hospital, is a continuation of the dead-house and privy, and is used only for boiling water, preparation of arrowroot, &c. The natives have their food cooked and brought to them.

16. No diet rolls, diet tables, or other returns are used for natives.

17. An assistant apothecary is the only attendant on the sick. The provision is not sufficient, but none other is just now available.

18 to 22. No replies to these queries.

23. The medical officer must apply for repairs, &c., through the officer commanding the station, but he has complete power over change of diet and medical comforts, so far as is allowed by the scale laid down and provided.

24. No reply to this query.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1 to 4. The burial ground is a short distance north east of the hospital, and has only been opened once in five years for an European, and that the case of an infant. No graveyard in the place has ever proved offensive. 5, 6. The dead of camp followers and bazaar people are either burnt or buried, according to caste, under the superintendence of relatives, or a party detailed for the purpose. No injury that I ever heard of has accrued to the public health from the present practice.

(Signed) W. Dacres Stanley, Captain,
Commanding 1st Extra Regiment.
James Donaldson, M.D.,
D.D. 1st Extra Regiment.

March 31, 1860.

VELLORE.

Accommodation.—Native Troops.—Infantry.—20th Regiment N. I. and 27th Regiment N. I.

References to Subjects and Queries.	Replies.
I. Topography.	1. Chains of hills, irregularly parallel to each other and running chiefly in a north-west and south-east direction, form a large basin of alluvial soil, in the north-east extremity of which the cantonment, bazaars, and fort are placed. Much of this land, from the great number of tanks in the vicinity, is adapted for paddy cultivation. Near the bases of the hills the soil is sandy and dry; but as it slopes in a westward direction to the tank, damp, and in some localities swampy. The country is well adapted for the growth of wood; but it cannot be called jungly in the proper sense of that term. 2. The elevation of this station above the sea is 675 feet; but there is very little difference between the level of the station and that of the surrounding country. It is 35 feet above the Palaur river. One hill in the higher range was explored some time ago, but found ineligible as a sanitarium, from want of table land on the summit, and the scarcity or rather absence of water. 3. The nearest hill is about three quarters of a mile from the cantonment, and has an elevation of 780 feet above the plain. 4. The river Palaur, which is the nearest water, is one mile distant from the station. That part of the lines of the native regiments which runs westward, was subject to overflow from a nullah in the neighbourhood during the rains. To remedy this a bund was thrown across the nullah; but the rain-fall from higher parts of the lines, being thus intercepted, the whole became damp from saturation. The latest decision come to has been to demolish the huts and rebuild them on other ground. The ground is much broken in the vicinity; and that the whole locality is below the average as to its sanitary condition, seems to be proved by the noted unhealthiness of the houses in this quarter in seasons of epidemic visitations. 5. The external ventilation of the station is interfered with from the faultiness of the site, which had evidently been selected on military and not sanitary grounds. The internal ventilation is, of course, more easily remedied or adjusted. The general temperature of the station is raised materially, during the hot months, by the radiation of heat from the surrounding rocky hills. The prevailing winds in February were northerly; since March S.E. winds prevail more, they are hot during the day, but occasionally cold towards early morning, thereby causing a tendency to catarrhal complaints during the hot weather. The sea breeze occasionally towards the afternoon is strong; but is generally light or altogether failing, or is replaced by long shore winds, *i.e.*, direct north and south. 6. The surrounding country is generally cultivated. There is one irrigation tank on the south side of the station one mile distant, and another on the west side at a distance of two miles. Rice cultivation is carried on nearly on every side of the station and at no great distance. There is or used to be an indigo factory close to the native lines, the effluvia from which must be most unpleasant to those who live near. This in Europe would constitute a nuisance, and be considered objectionable on the score of injury to health, the same reasoning must apply, with still greater force, in a hot country. 7. The native town and bazaars are extensive and densely populated. 8. The soil is alluvium, overlying primitive rock in a greater or lesser degree of disintegration; and this soil varies in thickness from a few inches to 5 or 6 feet. It appears probable from the nature of the whole locality and its adaptation for the erection of forts in the hills, and in the plain, that the ground generally must have been peopled from a very early period of Indian History. 9. Water is generally found at a depth of 10 feet below the surface level; and in the driest season at a depth of about 12 feet. 10. The surface drainage of the hills in the immediate vicinity of the station is conveyed into the fort ditch, and the surplus water passed out through channels, provided for that purpose, to the paddy fields lying westward of the cantonment. In India water is too important an element to be wasted. There are no stagnant pools near the station. 11. The water supply is derived from wells and an open tank, which latter has a constant supply of water, varying in depth according to the season. The tank water is used solely for drinking purposes; and no bathing is permitted in it. The tank is provided with a

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References to Subjects and Queries.	Replies.
I. Topography—*cont.*	check dam and reservoir, which collect and return any impurities that would otherwise flow into it from its supply channel. The wells are free from all noxious matters. No nuisance or malaria proceeds from any tank within or without the station. 12. The drinking water of the station is colourless and inodorous; but in most of the wells it is brackish, from the large quantity of saline ingredients in the soil. There is abundance of soft water for lavatory purposes; but unless new comers have been previously warned drinking the harder water is apt to cause diarrhœa, &c., from the amount of its saline constituents. Water is too near the surface to require any mechanical contrivance for raising it. 13. No reply to this query. 14. New stations are selected by mixed committees of military and medical officers, convened by general order of Government. These important matters have hitherto been left too much to chance, or the inquiries have been conducted rather with a view to military occupation, fitness, or financial means at the time, than on any recognised sanitary principle. It appears desirable that a peculiar fitness (by previous study or opportunity) for such inquiries should be sought for in the members of such committees, a point very frequently overlooked, or set aside altogether in favour of the claims of rank and seniority in the surface.
II. CLIMATE.	1. 2. Up to the present time no regular meteorological observations have been made. 3. All tropical climates are (*ceteris paribus*) materially influenced by the atmospherical disturbances present at the time. This is generally considered a hot but healthy station for both Europeans and natives, especially for the latter, as being exempted from the great vicissitudes of temperature experienced higher up the country during the height of the hot and cold seasons. The air cannot be considered as rendered impure by dust or other admixtures. 4. No reply to this query. 5. Colonel Bayley has served nearly 40 years. He has been stationed at Nagpore for 9 years, Bangalore twice, Secunderabad, Asseerghur Dhoolia, Mulligaum, Belgaum, Paulghautcherry, Cannanore twice, and French Rocks. At none of these stations, during his sojourn, was there any extraordinary amount of sickness among the troops, European or native, except in the year 1859, at Bangalore, when his regiment, the 20th Madras Native Infantry, suffered severely from fever, a visitation to which the native troops there are occasionally liable.
III. SANITARY CONDITION OF STATION.	1, 2, 3. General plan of Vellore, with plans of the cantonments and barracks are transmitted. 4. No reply to this query. 5. The windows of the artillery barracks are on opposite sides, and open outwards. The barracks have no verandahs. 6. The ordinary barrack iron cot is used in the barracks here. 7. No reply to this query. 8. There is no provision made for ventilation save by the doors and windows; and there is no measure whatever taken for cooling the air of the barrack rooms. 9, 10. The walls of the barracks are built of brick and chunam, with a tiled roof, supported on jungle wood rafters and bamboos. The flooring is constructed of tiles and cement, and is raised 6 inches from the level of this ground. 11. It is recommended that the barrack walls be raised 4 feet and that there should be a verandah both to the front and rear of the building, roofed with flat and pan-tiles, and that provision be made for the thorough ventilation of the building. All barrack and cantonment repairs are executed, when needed, by the Engineer's Departments on the requisition of the commanding officer. The walls and ceilings of the barracks are cleansed and whitewashed thrice during each year; but more frequently if considered desirable by the commanding officer. 12. There are no lavatories in use in the barracks. 13. 14, 15, 16. No replies to these queries. No stagnant water near the station. 17. The local prisoners are employed to attend to the drains, roads, &c. in the cantonment and its vicinity, an operation which they perform efficiently. Night soil, manure, &c., is carted away by night to a distance from the station. As a general rule the drainage is exceedingly defective. 18. The surface of the cantonment is kept free from vegetation; and there are no old walls, thick hedges, &c., interfering with the ventilation of the station. There are some native huts, however, that it is strongly recommended should be removed forthwith; they interfere very much with the ventilation of the officers' quarters and occasionally the stench from them is abominable. 19. The bazaar is well drained. There are no latrines, and cleanliness is carefully attended to. The natives, generally very attentive to personal cleanliness, appear perfectly indifferent to the condition of their houses, few of which are without those hot beds of disease, dung-heaps and cesspits. Wind blowing over the native houses causes a nuisance in barracks. The drainage from the mehals, in which the State prisoners reside, is a constant source of annoyance to the European troops in garrison. This latter nuisance is caused by the filthy habits of the followers of the State prisoners. 20. There is no public slaughtering place in the station; the butchers slaughter such animals as may be required within their own precincts. No nuisance is experienced from this plan. 21, 22, 23. No replies to these queries.
Officers Quarters.	1. There are no quarters for officers here. The officers' houses are situated between the native town and the lines of the native troops, much too near to both. The compounds are small and closely crowded together, and the ventilation and drainage are bad. A number of native huts have been built near the officers' houses, which it is desirable should be levelled, as also a number of wretched huts on the bund of the tank, between the native lines, and the officers' houses. These huts interfere sadly with the ventilation, which in this notoriously unhealthy part of the station should be as free as possible.

References to Subjects and Queries.	Replies.
IV. Health of the Troops.	1. The station and district generally may be considered healthy. 2. Like most other places in the southern part of India, Vellore, and the surrounding districts have occasionally suffered from visitations of epidemic disease; but there has been no outbreak of the kind for some years. Spleen disease is not prevalent, so far as can be ascertained. 3. The fertility of the country and consequent well being and comfort of the people, proximity to the sea, the saving of fatigue on journeys by the establishment of the rail, the abundance of water in most seasons, the shade afforded by trees, and the total absence of jungle may each and all in a certain degree serve to account for the general good health of the population. Fevers may, of course, be expected to prevail after the drying up of the paddy fields; but, so far as I can learn, these are of simple types, with few serious complications. 4. The 20th regiment Native Infantry had been stationed at Bangalore. The regiment had suffered much from fever, in part attributable to former residence at French Rocks, near Seringapatam, a fever of the same type, and prevailing to the same extent as that which assailed the 15th regiment Native Infantry at Bangalore in 1848, after a march through the same part of the country from Cannanore. The 20th regiment, as might have been expected, though healthy on arrival, has had many of its men suffer from relapses of fever; but the type has been either ephemeral or quotidian without previous rigor, or serious complication. 5 to 8. No replies to these queries. 9. Experience has shown that most of the lower hill stations in Bengal have proved unhealthy at some seasons, as predisposing to diarrhœa of a low, exhausting, and untractable kind. This is not the case with the Neilgherries, and, excepting for certain forms of diseases as laid down in the medical code, they may be considered suitable to all classes of patients. The minor ranges in the Madras Presidency do not appear liable to this serious objection as sanitaria, judging for example by the Ramandroog in the ceded districts, which although of no great altitudes, has been found beneficial to the health of convalescents of the European regiments and artillery, from the adjoining military station Bellary. 10 to 13. No replies to these queries. 14. Our hill sanitaria (as Jackatalla) are admirably adapted for the recovery of convalescents or for a longer or shorter period of residence for young or ill-developed soldiers, unable to stand up against the fatigue of initiatory drill in the plains. But once acclimatized I incline to the opinion that service on the plains would, under the improved condition of the European soldiers, as to barrack accommodation, means of ventilation, &c. &c., tend more to general efficiency for all work, than continuous residence on the hills with short periods of emergent service on the plains. This opinion seems to be borne out by the observed fact, that those who have resided for years in our hill climates, bear the heat and fatigue worse than others who have not been so fortunate, for a considerable period after the return to the plains. This point, however, must be decided by future experience. Frequent changes of station, as far as the relief of a whole regiment is concerned, are to be deprecated, as tending to the production of debt, and discontent among the men, and inconvenience to officers and their families, unless it can be shown, that the health of the troops (regiment, &c.) has suffered from over-lengthened residence at a hot or sickly station. Care must of course be taken that no individual case be made to suffer by want of necessary change to other stations. 15. No reply to this query. 16. Mere altitude, although a very important element in the selection of a sanitarium is not the only point to be attended to, but local circumstances, frequently hidden or obscure as active agents of disease, must also be taken into account. As a proof of this I may cite the instance of the great Hill of Penang, so called, although its height is only 2,700 feet above sea level. The whole chain, of which this is the summit, is encircled at the base by forest jungle, or towards the sea by mangrove bushes. Most of the hills to the south, where the latter vegetation prevails, possess a most deadly climate, although very little lower than the great hill. This has one of the finest climates in the world, while, strangely enough, most of the hills lower than this and far below the level of the southern range, are quite healthy; others rising above these again are the reverse, and though in the same chain (experience of 6 years' residence on the island). 17, 18. No replies for these queries. 19. Troops should land in India soon after the commencement of the cold weather. 20. On landing young half grown lads should be sent to the hills in the first instance, and gradually acclimatized; and the remainder to an intermediate climate, such as Bangalore if possible. 21, 22. No replies to these queries. 23. I would suggest that medical boards, pension, and invalid committees should, if possible, be held at the larger stations of the army, where there can be no paucity of medical officers and at stated periods of the year, so as to avoid all hurry and confusion in the preparation of the necessary documents. 24. Invalids proceeding home from India should leave so as not to arrive at their destination before the month of May at soonest.
Diseases.	1, 2, 3. No replies to these queries. 4. Dracunculus does not appear to be a prevalent disease at this station. 5. I have long been of opinion that the greater proportion of so called rheumatic complaints among the native troops are due to a venereal taint, never acknowledged or treated professionally, but cured for the time by empirical measures, such as mercury in large or small doses, &c. &c. Those who have charge of dispensaries for civil patients and paupers are cognizant of the great amount of venereal disease which prevails in all Indian stations. Unless some efficient system of early detection (such as the French) were adopted, Lock

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	Hospitals, although desirable in some respects, would soon come to be looked on, as convenient places for cure in the same way as the civil dispensaries now are; but little would be gained in the way of prevention.
	6. The troops at the station are the European veteran battalion, the 20th regiment of native infantry and the 27th regiment native infantry, the former are very healthy. Fever of the ephemeral, quotidian, tertian, and in rare cases quartan types are occasionally prevalent. Few cases of disentery have occured; but no cases of cholera this year. There have been many sporadic cases of small pox; but it has not prevailed epidemically. Rheumatism is the most prevalent of all diseases among the native troops, and is not unfrequently simulated.
	7, 8. Zymotic diseases, embracing those already mentioned, and including others of similar natures, not having prevailed at the station for a very considerable period, nothing can be adduced bearing on the solution or elucidation of the subject of these diseases.
	9. Men known to be subject to fever are encouraged to resort at any time to the hospital (although not actually reporting sick) for bark and quinine; the natives generally are well aware of the prophylactic virtues of the latter drug.
	10. Epidemic influences, although not dependent on or caused by local circumstances, strictly speaking are yet so controllable as to duration, virulence, &c. &c., by sanitary measures, that too great attention cannot be paid to the observance of every possible precaution against fetid accumulations, obstruction of ventilation, scarcity of food, &c. &c. Local sanitary measures, tending to these objects, are now in progress in the cantonment and station generally.
V. INTEMPERANCE.	1 to 5. No replies to these queries.
	6, 7. The introduction of the lighter wines of France, Australia, or the Cape, at cheap rates as well as malt liquor, would be an incalculable boon to the soldier and a saving to the state. The taste for toddy, and arrack (not easily acquired by young soldiers) would thus die away, and good liquor supply the place of bad. All experience shows that some amount of stimulant must and will be had recourse to in hot climates by both officers and soldiers, and the purer these liquors are the better for the general health and efficiency of the troops. It is not, at the same time, deniable that temperance soldiers are equally if not more effective; but these will always form the minority, it is to be feared, in British armies.
	8. The abolition of spirits would tend greatly to the decrease of hepatic and other complaints. Wine (of a light kind) in moderation might be made to supply this. As an instance I may mention, as a fact, that English and other labourers in South Australia now prefer their home-made wines to all others, and even to beer, while spirits are going rapidly out. These colonies will shortly be in a position to export first class wines in large quantities. In many parts of India, as at Kunawur, &c., in the Himalayas, similar wines might be produced at a low cost, it being a grape bearing country.
	9 to 11. No replies to these queries.
XII. HOSPITALS.	1, 2. The hospital is distant from the barracks about 300 yards and altogether distinct from the bazaar and private residences. It is nearly surrounded by buildings having a greater elevation than itself; on this account the ventilation is very imperfect.
	3, 4. No replies to these questions.
	5. The height of the lowest wards above the ground is 18 inches. No provision is made for the free perflation of air beneath the floor. The rain-fall is conveyed away into the ditch of the fort. The hospital has single walls, built of brick and chunam, roofed with tiles and supported on bamboos. The radiation of heat from the arsenal walls is very great. There is a verandah on one side 8 ft. 6 in. wide; it is too small ever to be used for the accommodation of sick, convalescents, and others. The hospital consists of one flat. No winds, save eddying currents, can touch the hospital. The windows open outwards; but they are too small (3 ft. by 2 ft.), for any practical use in ventilating or cooling the atmosphere.
	6. Ventilation is effected by the doors and windows only.
	7, 24. No replies to these questions.
XIII. BURIAL OF THE DEAD.	1 to 7. The burial ground has a situation centrical between the station and the native town. Its area is 17,368 square yards. The ground is carefully kept. No other information is given under this head.

(Signed) J. W. BAYLEY, Col. 20th N. I.
Commanding Station.
J. W. MAILLARDET, Surgeon, (?)
20th Reg., N. I.
SENIOR ENECK, Medical officer.
H. G. O'HARA, Dep. Commissary,
2nd Assist., District Engineer,
North Arcot.

30th March 1860.

VIZIANAGRUM.

Accommodation. Native troops, Infantry, 37th and 46th Reg., N. I.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station presents generally an undulating appearance, being hilly towards the north-west and north as far as Cheepropilly, a large village 16 miles north of Vizianagrum. The remaining portion or the country round the cantonment is flat, and generally open with much waste land. There are a number of tanks in the vicinity, many of which cover from 10 to 15 square chains. 2. There are no means of ascertaining the elevation of the station; but the ground about 2½ miles south of the cantonment is much higher, and better adapted in every way for a station than the present site. 3. There is a hill, lately occupied as a sanatarium, situated about 40 miles from the station, named Galleepareevatum, the level of which is about one mile above the sea. The level above the station is not known. 4. The nearest flowing water is a large river, about 200 feet in breadth, situated about 12 miles from the cantonment, near the town of Conadah. On the east side of the station, however, there is a large tank at a distance of 200 yards. The vicinity of the station is low and subject to inundations in heavy rains. There are many ravines near; but what their effect on health is, I am unable to say. 5. The station is situated on high ground unencumbered with trees, and the adjacent ground being principally open and uncultivated, the ventilation is free and good. The temperature is not raised by the buildings being exposed to reflected sun heat. The station is exposed to cold sea breezes and land winds; and when the latter prevails from the north-west, it is productive of colds, and a mild description of fever. 6. The surrounding country is principally cultivated. There are no works of irrigation of any great extent, and none nearer than 4 miles. Artificial irrigation is not generally thought to have any bad effect on the health of the station. Rice cultivation is not prohibited, it is grown in abundance to the north of the cantonment; but prohibited within the limits of the station. Indigo and hemp are cultivated throughout the district, but not sufficiently near to be of any nuisance. 7. The town of Vizianagrum is distant from the cantonment about one mile; and Bimlipatam, formerly a Dutch settlement, is situated about 16 miles distant to the south-east. 8. I am unable to give the geological structure, surface and subsoil of the district, but the station stands on ground which was never before occupied by a population. 9. Water is generally found during the dry season at a depth of 25 to 30 feet below the surface and about 15 feet below during the rainy season. 10. The station being on ground considerably higher than that adjacent to it, the whole of the rain-fall, or nearly so, as well as the drainage is carried off into the low land. 11. The water supplied is derived chiefly from wells during the hot season, at which time the supply is rather scanty; but an abundance of good water can be procured from the tanks during the rainy and cold season. There is a great deal of water stored in tanks, but not usually for drinking purposes, many of these tanks cover an area of from one quarter to one half a square mile when full. There are very few tanks within the limit of the cantonment. They are from a distance of one half to one mile. Tank water is used by the natives for drinking and all purposes, such as washing clothes, bathing, &c., and is of good quality. The tanks are almost all entirely dependent on the rain-fall for the water which they contain, as very few have springs. The nature of the plants and animals they contain is unknown; but, generally speaking, some little vegetation enters the tank. Many of them receive the drainage of the high ground, most of which is very foul, and the margins of the principal portion are used as public privies, consequently the water must be polluted, and no doubt causes many of the diseases which have prevailed. I am not of opinion that any malaria arises from any of the tanks adjacent to the station sufficient to be of any injury to the cantonment or lines; but I would suggest that public privies should be erected in or near the town of Vizianagrum, and properly flushed now and again,—say once, twice, or thrice a week. 12. The supply of water is good; but the quality is generally bad. Good clear palatable water, free from smell, has to be brought from some distance. Its chemical and microscopic conditions have not been ascertained, there being no means for that purpose at hand. Leathern buckets and ropes are generally used to raise the water; and I do not think any better water could be procured than that now used at the station. 13. I am not aware of any other topographical points bearing on the health of the station, not included in the foregoing replies. 14. I am unable to suggest anything in reference to the mode of selecting new stations.
II. Climate.	1. There are no means or instruments available at the station for conducting and registering meteorological observations. 2, 3, 4. No reply to these queries. 5. I have served at Jubbulpore, Kamptee, Jaulah, Secunderabad, Palaveram, Trichinopoly, Bangalore, Palamcottah, Quilon, Penang, Thyetmyo, and Tonghoo in Burmah, and should consider the climate of the stations in Burmah as salubrious and conducive to the health of Europeans as any I have been at; but not so for native troops, which I consider mainly owing to their diet, and the hospitals not being at all adapted to afford sufficient warmth for an invalid in the cold season, and from their having no blanket or any warm covering of their own to keep them warm; and I would strongly recommend that each sepoy serving in Burmah should be furnished with a thick Mysore cumbly, which I have no doubt would be found most conducive to health. I have come to this conclusion from the fact that the servants who go over to Burmah, and are moderately cared for and kept from sleeping on the ground, enjoy good health. Another cause of much sickness in the wet season is from guards, particularly those that mount at night, having to go a considerable distance in heavy rain, and consequently are thoroughly drenched before they reach their posts, and

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References to Subjects and Queries.	Replies.
II. Climate—*cont.*	and have to remain in their wet clothes all night. The only remedy I would suggest for this would be to allow such guards to march to their posts any time after 2 o'clock p.m., when there might be a break in the weather, and that each guard-house have bamboo sleeping places, raised about three feet from the ground, sufficient for the men to lie down on. The climate of Trichinopoly as a station, both for European and native troops, I consider to be as salubrious and conducive to health as any station I have served at. Secunderabad, for Europeans, I have considered the reverse of this, at least it was so during the 5 years, at two different periods, that I was there. This was many years ago and the unhealthiness was considered attributable to the sites that the European barracks were on. I do not recollect that any of the other stations I have been at were injurious to the health of Europeans or natives.
III. Sanitary Condition of Station.	1, 2. No reply to these queries. 3. A ground plan of the barracks occupied by the 37th regiment grenadiers and 46th regiment native infantry, is transmitted. 4. No reply to this question. 5. In the military hospitals there are windows all round, and they open from the inside. There is a verandah on all sides of each barrack with the exception of the west end, which is enclosed and used as a prison room. The verandahs are never used as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils. 6. There are no bedsteads or bedding in use in the barracks. 7. The native tent is constructed of three cloths, the two outer being white, and the inner one blue, supported by two upright poles, passing through a ridge pole. The height of the tent is from 10 to 12 feet; and it is 28 feet long by 15 feet broad. It is fastened down by 25 pegs, and has a fly door in front supported by four poles and two stays. 8. The ventilation of the barrack is very inferior, there being no windows, but doors only at an interval of every 12 feet, and when these are opened at early morning the heat of the interior is immense. The ventilation is insufficient to keep the air pure by night as well as day. No means are used for cooling barrack rooms of native corps. 9, 10. No reply to these queries. 11. All military public buildings in the cantonment are kept in repair by the engineers department; and the repairs are executed as speedily as possible. The general sanitary state of this cantonment is under the officer commanding. There is no fixed time for white-washing and cleansing the walls and ceilings of barrack rooms, but it is done whenever considered necessary. 12 to 15. No reply to these queries. 16. No part of any building used as a barrack or hospital is damp. There are no foul ditches near the station. 17. No reply. 18. The surface of the cantonment is kept free from vegetation. There are no old walls, thick hedges, &c., interfering with the ventilation of the station, &c. 19. No nuisance is experienced in barracks from wind blowing over native dwellings. 20 to 23. No reply to these queries.
Officers' Quarters.	No information under this head.
IV. Health of the Troops.	1. The station of Vizianagrum, and the district in which it is situated, are generally considered healthy. 2. Fevers, beriberi, and rheumatic affections are the most common complaints among the native population. Epidemic diseases are not prevalent. 3. My residence at this station being only of little more than 2 months' standing, I have not sufficient personal knowledge of the locality to speak of the unhealthiness or healthiness of the neighbouring native population. 4. The 46th and 37th regiments at present stationed here were previously on service in Pegu, and both corps were more or less affected in that province with the endemic diseases, prevalent there, viz., fevers, beriberi, burning sensation at the soles of the feet, rheumatism, anasarca, atrophy, and bowel complaints. The two regiments served about 3 years each in Pegu, and the 47th Native Infantry arrived here from that country in April 1858, and the 37th grenadiers in January last; many of the men of both corps being at the time of their arrival in a very debilitated and emaciated state, resulting from their having suffered from the prevailing diseases of that climate. 5. The 37th regiment grenadiers are temporarily encamped on the parade ground until their lines now in progress are completed, but no case of disease can be traced to this source. 6 to 16. Never having been in charge of troops at hill stations, I am unable to afford any information from personal experience regarding the sanitary state, &c., of troops at such stations. 17 to 24. No reply to these queries.
Diseases.	1. There are regular inspection parades once a week for the discovery of incipient diseases amongst the recruits of the 37th regiment of grenadiers at this station. 2, 3, 4. Neither scorbutic disease, hepatic disease, nor dracunculus have, as far as I am aware, been prevalent at this station. No case of either exists at present. 5. The proportion of venereal cases appears to be somewhat large, and I am inclined to recommend the re-establishing of lock hospitals as a precaution for lessening the liability of the soldier, European or Native, to this disease. 6. The troops at this station do not appear to suffer much from diseases in an epidemic form. The principal diseases are,— Fever of the intermittent type, this is the most prevalent form and is at times endemic. *Dysentery* occasionally occurs but not in an epidemic form. *Cholera* sporadic cases only generally occur. *Small Pox* has been lately somewhat prevalent in the town, but no fatal case has occurred among the troops. 7 to 10. No replies to any of these questions.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1. The burial ground is situated at the south end of the cantonment in the officers' lines, and the prevailing south and south-west winds pass right through the whole of the officers' lines. 2. Its area is 8,448 square feet and the soil is composed partly of dark and red earth and partly of gravel. There is no drainage, the surface being flat, but the ground is always kept with great care becoming its sacred purpose. 3. All burials take place at sun-rise or sun-set. The graves are dug five feet deep and three wide, the length being according to circumstances, they are two feet apart. When the surface of the ground shows by the external marks of graves and head stones, that there is no more space for interment, the ground is considered full. Graves are never re-opened for interment, except by mistake, when they are immediately closed up again, or by family request, the previous sanction of the chaplain having been obtained for so doing. Interment takes place, both at ordinary times, and during epidemics, within 24 hours. There are no burial grounds set apart for native troops by government, they are buried according to the usage of the several castes. 5. The grave yard is not offensive. The British soldier is interred according to the rites of the Church of which he is a member. Roman Catholics have their burial ground granted by Government, but Protestant dissenters have a small portion of ground (not consecrated) set apart for their use in the church of England burial ground by order of Government. 5. The dead of camp followers and bazar people are disposed of according to caste. 6. No injury at present accrues to the public health from the present practice. 7. Burial grounds should at all times be situated away and clear from cantonments. A room 12 yards by 6 should be built at the outer entry of the burial ground gate for the protection of funerals from inclement weather and also to afford a place of retirement for the chaplain.

(Signed) D. T. Morton, Surgeon,
In Medical charge of the Station Hospital.
J. Carter, Overseer,
Department Public Works.
A. Pinson, Colonel,
Commanding Vizianagrum.

26th May 1860.

FRENCH ROCKS.

Accommodation.—Native Infantry.—One regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the surrounding country is undulating, dry, and open, scattered with low ranges of hills. There is but little or no jungle; a large water tank is, however, in the neighbourhood. 2. The elevation of the station above the sea is 2,560 feet, but it is on a level with the adjacent country. There is no higher or healthier ground near the station. 3. The station is situated on the table-land of Mysore; there are no mountains or high hills in the immediate neighbourhood. 4. The nearest water is at the distance of a quarter of a mile, and consists of a large tank, one side of which is shallow and marshy, but not to any great extent. The vicinity is not liable to overflow. There are a few small ravines, which do not appear to have any effect on the health of the station. 5. The station is open and exposed to the wind. There are trees and hedges in the station, but there are very few around it. No old walls, thick hedges, &c. exist in the station, nor is it so encumbered by houses as to interfere with ventilation. The buildings are not exposed to reflected sun heat. The station is exposed to variable winds, but not to the sea breeze, being too far from the coast for it to have any perceptible influence on health. 6. The surrounding country is cultivated, but the only work of irrigation near the station is the lake or tank about a quarter of a mile distant. Artificial irrigation is not observed to affect the health of the station. The cultivation of rice is prohibited within about a mile from the station. There is no cultivation of indigo or preparation of hemp or flax carried on near the station. 7. There is no large city or town nearer the station than Seringapatam, which is six miles distant. 8. The surface soil of the district is light and sandy, with a rocky subsoil. The ground of the station has not been occupied by population before the formation of the station, but was, 40 years back, cultivated with grain. 9. Water is found during the dry season at about 20 feet below the surface, and during the rainy season at a depth of 12 or 15 feet, but not in all situations. 10. The rain-fall flows readily away and is easily drained off; it does not lie for any length of time on the surface. No drainage from higher ground passes into the subsoil of the station. 11. The water supply of the station is obtained from sunken wells and the tank. It is stored until required for irrigation in the tank, which is about a quarter of a square mile in extent. The tank generally pretty full, never dry. It contains various fish and the usual water plants, and the water in it is principally used for bathing. Neither the tank nor any of the wells are liable to pollution from any source. Slight malaria proceeds from the tank, especially after the rains, which could be prevented by drainage.

FRENCH ROCKS. MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	12. There is an abundance of water, pretty clear and tasteless in quality. The well water is hard, but that from the tank is soft and good. There is a dam and sluice at the tank. The water from the wells is drawn by buckets.
	13. There are no other topographical points bearing on health that we are aware of.
	14. Cannot say what preliminary examinations or inquiries are made previous to the selection of new stations.
II. CLIMATE.	1. A weathercock, rain-gauge, barometer, and thermometer are the only instruments available at the station for conducting and registering meteorological observations.
	2. There are no meteorological observations on record.
	3. The climate is good, being dry during eight months in the year, and somewhat moist during the monsoon. It is not very variable, pretty free from fog and damp, and not affected by irrigation. There are occasional dust storms, which last but a short time. The usual diet only is required, but warm clothing is necessary during the cold weather. Drills and exercises take place in the mornings and evenings. The most unhealthy months are November and December, during which time intermittent fever is the prevailing disease.
	4. There is no district near the station the climate of which is more conducive to health than that of the station.
	5. I have served at many of the stations of the Madras Presidency garrisoned by native troops. None of them appeared to be positively injurious.
III. SANITARY CONDITION OF STATION.	1, 2. A plan of the station is forwarded.
	3 to 6. No reply to these queries.
	7. The tents used in camp are pitched on two uprights and a ridge pole; the fly sloping to the ground without a perpendicular part; the dimensions from pole to pole being 10 feet. They contain 25 men each, and the full length of each tent is 27 feet, the breadth being 11½ feet, and the height 9 feet.
	8. The ventilation of the huts is effected entirely by the doors; that of the guard-rooms by windows. The latter are well ventilated, but the ventilation of the huts is (theoretically) insufficient.
	9. The barracks are constructed of brick and mortar, the tents of cotton cloth, and huts of earth, with thatched or tiled roofs.
	10. Not applicable to native barracks.
	11. The materials and construction of the barracks, tents, and huts are all suitable to the climate. The barracks and cantonments are kept in repair by the Public Works Department, and the repairs are generally quickly executed. The commanding officer is responsible for the sanitary state of the cantonment. The walls and ceilings of barracks are cleansed and whitewashed once a year.
	12, 13. There are no lavatories, cook-houses, or conveniences for washing and drying linen.
	14. There are at present no privies except those in the hospital.
	15. The barracks do not require to be lighted at night.
	16. There are no foul ditches.
	17. Scavengers remove the refuse and night soil every morning by contract. It is used as manure by the neighbouring ryots.
	18. The surface of the cantonment is kept free from vegetation, and there are no old walls, thick hedges, &c. to interfere with the ventilation of the station or bazaar.
	19. The drainage of the bazaar is good; the ventilation free, and the water supply good. It is not crowded. The bazaar, being a native one, is under the immediate control of the adjutant, guided by the general regulations; these afford comfort and efficiency. There are no other native houses near the station. No nuisance is experienced in barracks from wind blowing over the native dwellings.
	20. The few animals required are slaughtered at a considerable distance from the station, and no nuisance is experienced from it.
	21 to 23. These queries are not applicable to this station.
Officers' Quarters.	1. There are no public quarters for officers; they reside in private bungalows, which are in good condition in every respect. No improvement is required.
IV. HEALTH OF THE TROOPS.	1, 2, 3. Intermittent fever is common amongst the native population; otherwise the station and district are generally healthy, except during the months of November, December, and January, the cold season. The intermittent fever is attributed in the station to the close vicinity of the tank, and in Seringapatam to a broad shallow part of the river Cauvery.
	4. The troops previous to coming to this station were at Rangoon for three years, and left there on the 24th March 1860. Their state of health there was not good, the chief diseases being beriberi, intermittents, and diarrhœa. The regiment arrived at this station on 29th April 1860 in good health, from the sickly men having been transferred to the general hospital, or to their villages. They have not suffered much from any disease since arrival, but the commonest have been rheumatism and intermittents. No part of the men's present accommodation is more or less healthy than the rest.
	5. The troops at the station are not camped out.
	6, 7, 8. I have had no experience with troops at hill stations, but I decidedly approve of their selection for troops.
	9. On first arrival at hill stations, I believe troops are liable to be attacked with bowel complaints.
	10. Every precaution is necessary in regard to diet, clothing, shelter, duties, &c., to enable the men to obtain the greatest benefit from such residence.
	11. At most hill stations the rainy season is considered the healthiest. The shortest period to obtain the full benefit of residence in such stations must depend on the circumstances of each individual, but in general a year is required.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	12. There is no period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service on the plains. 13. The special precautions required on going to hill stations are,—to be careful in diet, and avoid exposure to the sun, night dew, and land winds. 14. It would be most conducive to the health of troops serving in India to locate them on hill stations, with short periods of service in the plains, provided the changes are not too frequent. If moved at the proper season, frequent change of station on plains is beneficial to the health and spirits of troops. 15. Cannot say if the barrack accommodation and sanitaria provided at hill stations be sufficient. 16. From 4,000 to 6,000 feet above the sea would be the most suitable elevation as sites for hill stations. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. A dry cultivated surface not surrounded by jungle is the most healthy for stations. 19. Soldiers proceeding to India should be from 20 to 25 years of age, and should land there at the beginning of the cold season. Recruits on landing should avoid indulgence in liquor and exposure to the sun, and should also be sparing in the use of fruit. 20. Troops should, if practicable, be sent to an intermediate station before being sent to India and on landing should be sent to hill stations. 21. The present modes of transport of troops into the interior are by marching, rail, or water, when available, and bullock transit. When the mode is by marching, long marches and exposure to the night air or sun should be avoided, and great care should be taken in the selection of camp ground. Troops should have the best bedding available, and, above all things, avoid spirituous liquors. Coffee should be given on the march. 22. A British soldier should serve 20 years in India, but a good deal would depend on constitution. 23. Conflict of opinion sometimes exists in medical boards in reference to invaliding, but we are not prepared to offer any suggestion on the subject. 24. Invalids should leave India for home so as to arrive in England in the mild weather.
Diseases.	1. There are regular weekly inspection parades held at the station for the discovery of incipient diseases. 2. There has been no case of scorbutus among the troops at the station. 3. Usually there is no hepatic case under treatment, as such disease is rare among natives, and there are but few Europeans at the station. The principal cause of this disease is evidently the climate, though cold following continued heat, excess in eating or drinking, and want of exercise assist in its development. It is sometimes the consequence of dysentery, more commonly not. We know of no prophylactic measures other than the common and often ineffectual ones of avoiding the avoidable causes. 4. Dracunculus is still more rare than hepatic disease. 5. The proportion of venereal cases is one to five from all other diseases calculated for one month. The forcible removal of prostitutes to dispensaries has been found to diminish the number of venereal cases. The institution of Lock hospitals would, we believe, be advantageous to the army, though objectionable on other grounds. 6. The following table shows the diseases of epidemic or endemic class which the troops have suffered from, with the proportion of admissions and deaths from those diseases to the total admissions and deaths :—

Diseases.	Admissions for One Month.	Deaths for One Month.	Total Admissions for One Month.	Total Deaths for One Month.
Fevers { Intermittent	1	—	10	—
Fevers { Ephemeral	1	—	30	—
Dysentery, cholera. (No case has occurred since arrival)	—	—	—	—
Small Pox. (Two cases have occurred, both after vaccination)	1	1	15	1
Rheumatism (is very common)	1	—	5	—

	7. The only zymotic diseases that have occurred have been a few cases of small-pox, showing a large proportion of fatal cases, probably from the milder cases not being known of. I have been too short a time at the station to know what the seasons are at which such diseases are prevalent, or the climatic or atmospheric conditions which precede or accompany their appearance, nor can I speak as to the sanitary condition of the bazaar, where these diseases are most prevalent. Among the native population the circumstances most evidently predisposing to small-pox are their indifference to vaccination, which they view as an useless attempt at interfering with fate, and, more rarely, their positive objection to it as the mark of a Nazarene. 8. It is not known how far the nature of a soldier's duties or occupations predisposes him to epidemic disease. 9. Quinine has not been tried as a prophylactic against malarial disease. 10. No recommendations are offered on any of the preceding points, as my experience is so limited.
V. Intemperance.	1. The soldiers at the station are temperate, and no confirmed drunkards are found among them.

FRENCH ROCKS. MADRAS.

References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	2. There is scarcely ever an admission into hospital, directly or indirectly, from diseases caused by intemperance. Drunkenness *per se* is punished as an offence. 3. Distilled spirits (arrack) are sold in the bazaar, but the quantity consumed by each man *per diem* is not ascertainable among native troops. Spirit forms no part of the soldiers' ration either at the station, on march, or in the field, and the men do not take a dram before morning parade. It is occasionally given to convalescents; it is variable in quality and amount. No drinks injurious to health, other than intoxicating drinks, are sold in the bazaar. 4. The consumption of spirits in moderation is conducive to health. They have no effect on discipline unless taken in excess, and they are then injurious. 5. Restriction in the use of spirituous liquors would be beneficial, but not so their abolition. 6. As a general rule, malt liquors or wines are preferable to spirits. 7 to 10. Tea, coffee, lemonade, &c. are not used at the station. The questions under these numbers refer to European troops, but I would suggest that tea, coffee, beer, and lemonade should be more used than at present, to the comparative exclusion of spirituous liquors. 11. By the bazaar regulations every encouragement must be given to the connexions of the men to settle as shopkeepers in the regimental bazaar, which is under the immediate control of the adjutant, and individuals available as coolies are allowed to reside within the boundaries. All bazaar residents are subject to trial and punishment by military courts, and to expulsion at the pleasure of the commanding officer. The dookans are all registered, and no person is allowed to establish one or reside in the bazaar without previous sanction from the commanding officer.
VI. DIET.	No information under this head.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress consists of cloth tunic and trousers,—the latter cotton in hot weather,—basket-work turban covered with oil skin, and native sandals. The accoutrements are musket, belts, and pouch. The dress is quite suitable for the climate and soldiers' duties at all seasons, with the exception of the turban. Warm clothing should be worn at hill stations, and light clothing on the plains, and the "solah" helmets at all stations. The soldiers should have flannel waistbands on the hills, and also on the plains, where there is a tendency to diarrhœa or cholera, and cloaks on night duty. At this station sepoys on guard are protected by sentry boxes and verandahs occasionally.
Duties.	1. Soldiers should be thoroughly drilled at home, or at some intermediate station before being sent to India. 2. At this station the duties are light, and consist of guard duty once in seven days, and drill one hour in the morning, and occasionally an hour in the evening. The men do not suffer in health from drill. The best hours for drills, parades, and marches are early morning. By general order there is route marching once a month. The men on an average have seven nights in bed during the week. 3. Guards are mounted close to the barracks. They mount at six in the morning and are relieved at six the next morning. Roll calls take place daily at sunset, and in the morning when there is no parade. Night guards are apt to be injurious, particularly in wet or damp weather; for this duty the men should be warmly clothed, and further protected if possible.
VIII. INSTRUCTION AND RECREATION.	1, 2. There is an English and vernacular school at the station, but no other means of instruction or recreation. No restriction is placed on natives in reference to exposure to the sun and rain out of barracks when off duty. No improvements are suggested. 3. The institution of soldiers' savings' banks would be decidedly advantageous. 4. There is plenty of shade from trees to enable the men to take exercise without injury, but there is none from sheds or verandahs.
IX. MILITARY PRISONS.	1. There are no defects in the construction of the solitary cells at this station.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the General Presidency Regulations. 2. The powers of the medical officers, in reference to the conduct of the line of march, &c., are limited to recommendations. 3. Camping grounds are selected on elevated and dry ground, at some distance from a village, and, if possible, on that which has never been previously occupied. Water is brought to the camps in water bags, carried by bullocks. 4. The number of tents required for the field hospital is supplied of the same kind as used by the force to which the sick belong. Sick and hospital supplies are transported by bearers and on bullock carts.
XII. HOSPITALS.	1, 2. The ground slopes slightly downwards from the hospital to the barrack buildings. It is a considerable distance from the bazaar, the sepahis lines and some open ground intervening between them. The site of the hospital is open, freely ventilated, and healthy as to drainage and elevation, but is probably not free from malaria. 3. The water supply is abundant and wholesome. 4. The outlet for the privy sewage (and there is none other) is immediately outside the enclosure surrounding the hospitals. 5. The height of the lowest wards above the ground is 3 feet. No provision is made for conveying away the roof water, but there are some open trenches around the hospital, which is sufficient for carrying away the rain-fall rapidly. The hospital is built of brick and chunam. The roof and walls are single, but of sufficient thickness to keep the building cool. There is a verandah on each side of the hospital, 10 feet broad. They are never used for the accommodation of sick, convalescents or others. The building consists of one flat.

References to Subjects and Queries.	Replies.

XII. Hospitals—*cont.*

TABLE of Hospital Accommodation.

Date of construction, A.D. 1830.

Total number of wards - - - - - - 1

Total regulation number of beds not fixed, can accommodate - - 40

Wards, Number.	Regulation Number of Sick in each Ward.	Dimensions of Ward.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.		Sq. feet.	Inches.		Inches.	Inches.
1	—	140	20	12	33,600	840	70	16	8	45	28

The hospital receives the full benefit of the prevailing winds. The windows open like a door, in two pieces. Their arrangement is good, but the doors are the great means of ventilation.

6. The ventilation of the wards is effected by means of the doors and windows, and also by some needless openings in the roof. There are no jalousies or jhilmils.

7, 8. There is no apparatus for cooling or warming the wards. The walls are cleansed, &c., once a year, and the floor of the ward twice a month. There is no ceiling.

9. The privy is simply a small separate house in one corner of the hospital enclosure, containing earthen pots, and having no door, but a doorway screened by a wall. It is properly drained and watered, but is not placed over a cesspit. It is not offensive outside.

10. There are no lavatory arrangements for the sick,

11. A few tubs, of different shapes, are provided for bathing the sick, which can be used as hip-baths, full-length baths, &c.

12. There is no hospital linen. Quilts, &c. are washed by the commissariat.

13. The storage is sufficient and dry.

14. The bedsteads used in hospital are wooden frames, with cotton tape stretched across, than which nothing could be better.

15. The kitchen is a small house in one corner of the enclosure, provided with earthen fire-places.

16. No diet tables are used. The statistical forms are those common to native troops throughout the Presidency.

17. One or two hospital orderlies, and a special orderly for any man who may require one, is all the attendance provided for the sick.

18. The sanitary condition of the hospital is good at present. We do not know that any epidemic disease, hospital gangrene, or pyæmia have appeared in the hospital, as distinguished from the station.

19. There are no deficiencies or sanitary defects which require improvement.

20. No provision for exercising convalescents is required.

21. Soldiers' sick wives and children can be treated at their homes if they wish it, but they seldom do. This arrangement is satisfactory.

22. There are no special local hospital regulations enforced at the station not included in the General Presidency Medical Regulations.

23. Requisitions for the repairs of hospital are attended to. The medical officer has no power over the diet.

24. There is no convalescent hospital or wards for convalescents, and none are required.

XIII. BURIAL OF THE DEAD.

1. The cantonment burial-ground is well situated. It is a short distance from the officers' quarters, and to windward during the south-west monsoon.

2. Its area is about an acre. The soil is sandy and dry, and the ground is carefully kept.

3. The grave space is 7 by 3, with an interval between each of from 10 to 20 feet. The depth of graves is from 5 to 6 feet, and not more than one body is ever buried in the same grave. Interment is compulsory at ordinary times and during epidemics within 24 hours. Most of the native population burn the bodies of their dead. Mahomedans and a few others have their own burial-grounds at a distance from the cantonment.

4. The grave-yard is never offensive.

5. The dead of camp followers, or bazaar people, are burned or buried at a distance from the camp.

6, 7. No injury accrues to the public health from the present practice, and no improvement can be suggested in reference to the burial or disposal of the dead.

(Signed) GEORGE LOGAN Colonel,
Commanding 6th Regiment N.I.
D. CAMPBELL, M.D., Assistant-Surgeon,
d. d. 6th Regiment N. I.

8th October 1860.

QUILON.
MADRAS.

QUILON.

Accommodation.—Native Troops—Infantry—Total of all ranks, 1,042.

Reference to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is flat and sandy. It is well wooded, and there is a fine sheet of water, the back water, and also a canal. 2. The station is slightly elevated above the sea, but is on the same level as the adjacent country. There is no higher or healthier ground in the vicinity of the station. 3. The nearest mountains to the station are the Wurrakally Hills, about 12 miles distant, in the direction of Trevandrum. 4. The sea is between 200 or 300 yards distant from the station, and the back water comes up close to it; there is also a canal running through the town and part of the station. During a very heavy monsoon the parade ground is sometimes overflowed, but it does not continue so beyond a few days. There is one water-pit within civil limits, but I am not aware, after every inquiry, that it has any injurious effect on the health of the station. However, as it is generally considered a nuisance, I purpose applying for its being filled up. 5. The station is open and well exposed to sea and land winds, the latter, however, causing rheumatism and neuralgia. The temperature of the station is not raised by exposure to reflected sun heat. 6. The surrounding country is tolerably well cultivated, but there are no works of irrigation near the station. Rice is not cultivated within the limits of the cantonment, but there is, however, a great deal of paddy cultivation to the north of cantonment and in close proximity to it, which does not, however, appear to affect the health of the people. Indigo is not cultivated, nor is the preparation of hemp or flax carried on near the station. 7. The large town of Quilon is in the vicinity of the station. 8. The surface and subsoil of the district are chiefly sand, with occasional breaks of laterite, From all I can learn, I have reason to suppose that the space now occupied by the cantonment was never occupied by any population before the present station was formed. 9. Water is usually found at a depth of from 15 to 20 feet during the dry season, but close up to the surface during the rains. 10. The rain-fall and water from surface springs are quickly absorbed. There is no higher ground near the station. 11. The water supply of the station is derived from wells only; there are no tanks. The well water, the only drinking water in the cantonment and native town, is not liable to pollution from leaves or other impurities falling into it. 12. Water is abundant and good, but there are no means of ascertaining its chemical composition. It is always drawn from the wells in buckets or by chatties. 13. I am not aware of any other topographical points bearing on the health of the station. 14. I cannot say what is the nature of the inquiries, &c. which are made previous to the selection of stations.
II. Climate.	1, 2. There are no instruments for conducting meteorological observations, and no table appears to have been kept here. 3. During the rains the weather is close and muggy, during the dry weather parching, but free from dust. There is one canal from this to Quilon, and great part of the way to Trevandrum. The mango jack, and cassarina grow well and luxuriantly. The troops are very healthy, and the diet suits the native, but would not do for the use of European soldiers as the bazaars, &c. are now managed. Light clothing is very necessary, in consequence of the enervating effect of the climate. Drill should be carried on in the mornings, from 5½ to 7 o'clock, the evenings being close and stifling. January, February, and March are considered most unhealthy months on account of the strong land winds that prevail. The remaining months are healthy, particularly those in which we have the monsoon, viz., from the 15th May to the 15th October. 4. I am not aware that there is any district near, the climate of which is more conducive to health than that of the station. 5. The following is a list of stations at which I have served:—Masulipatam, twice; Jaulnah; Palaveram, twice; Secunderabad, three times; Vizianagrum; Vizagapatam; Berhampore; Malacca; Vellore; Bangalore; Kolapore; Samulcottah; Rangoon; Tonghoo; Mangalore, and Quilon. At all the above stations, during the time the 8th Regiment served at each, they were very healthy, and neither officers nor men suffered from any epidemic or in any way.
III. Sanitary Condition of Station.	1, 2, 3. There is no engineer officer here, he being at this time located at Trichinopoly. No tracings of the country, stations, &c. have consequently been transmitted, as he only periodically visits this station, but has in his office a complete plan of the station. 4. There are 11 prison cells of the usual dimensions, 8 of which, however, are in a ruinous state and quite unfit for any purpose. 5. All the barracks and other public buildings are, with the exception of those occupied by the 45th Regiment, in an almost ruinous condition, without doors or windows, and as it appears they are not likely to be again ever required, are permitted to go to decay. The barracks or place of arms of the 45th Regiment Native Infantry has a verandah on either side, the whole length of the building, but these are never occupied as sleeping quarters. There are no jalousies or jhilmils. 6. No bedsteads are used in barracks. 7. The usual tents are issued to native regiments. 8. There are no means of ventilation, except when the doors are kept open, nor any means of cooling the air admitted. 9, 10. The barracks appear to be built of laterite and chunam; the floors are bricked. The sepoys' huts are constructed of bamboos, leaves, and grass. The floors are of mud, and raised about two feet above the level of the ground. 11. The materials appear to be suitable for the climate. The barracks and cantonments are kept in repair by the engineer officer located at Trichinopoly, who periodically visits the station.

Reference to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	The medical officer, together with the commanding officer, is responsible for the sanitary state of the station. The walls and ceilings of the barracks are cleansed and limewashed once a year. 12, 13. There are no lavatories, cook-houses, or means of cooking provided at the station, nor any conveniences for washing and drying the linen in cantonment; but the dhobies employed by the troops go some short distance to wash and dry the clothes. 14, 15. There are no privies or urinals. 16. The natural drainage is sufficient to carry away superfluous water during the monsoon. There are no drains. No part of any building used as a barrack or hospital is damp. There are no cesspits or foul ditches in the cantonment. 17. The officers keep their own compounds clean, and the lines are kept so by the men of the regiment, and cantonment by the scavenger carts allowed by Government. 18. The surface of the cantonment is kept free of vegetation, and there are no thick hedges, old walls, &c. interfering with the ventilation of the station. It would, however, have been of material benefit to the cantonment to pull down and remove the old barracks and other public buildings not now used, and which are falling to ruins, as it has several times occurred that the carcases of animals which have died from starvation and disease have been found in them, and on one occasion the body of a wretchedly diseased old woman, who appeared to have died of starvation, was discovered. 19. The civil bazaar, although well ventilated, being a broad street, is very dirty, and requires that the refuse, such as bad fish, &c., should be removed once at least every 24 hours. The bazaars are cleaned daily by the owners of the Dorkans, and the system established and regularly kept up appears sufficient for all purposes. The native huts are wretched in the extreme, being composed of nothing but bamboos, leaves, and grass, both for roofing and walls, mud for the purpose of wall building not being available. They are also very much huddled together, and cleanliness is not much attended to. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Three or four sheep are killed daily in the cantonment, about 300 yards from the lines, and all offal is immediately removed. Bullocks are killed at a short distance from the cantonment, but no nuisance is experienced in the station from the condition of the slaughtering places. 21, 22. There are no bazaar horses, cavalry stables, or picketing grounds at Quilon. 23. There are no quarters of any kind whatever for married non-commissioned officers or men.
Officers' Quarters.	1. The officers' houses are all well situated, most of them being close to the sea. No drainage is required, as the water soaks into the sandy soil around them at once. No improvements are suggested.
IV. Health of the Troops.	1. The station, district, and adjoining native population are healthy. 2. The most prevalent diseases are skin diseases, and these are greatly to be attributed to the want of proper vegetable diet and the large quantities of fish consumed by the inhabitants. 3. The healthiness of the neighbouring native population is attributable to the prevalence of the sea breezes. 4. The troops were at Madras before coming to the present station, from 21st April 1858 to March 1859, and there the men suffered chiefly from beri-beri and general debility contracted in Burmah. They arrived here on 9th March 1859, much improved in health, and since then it has suffered principally from itch, boils, and intermittent fever of a mild type. No portion of the men's accommodation is more unhealthy than the rest. 5. The troops are never camped out. 6, 7. No experience of hill stations. 8. I decidedly approve of the selection of hill stations, particularly for European troops. 9, 10. Never been in charge of troops at hill stations, 11. The hot season is best adapted for residence in hill stations, and one year is the shortest period to obtain the benefit of such residence. 12. No experience with troops at hill stations. 13. The special precautions required for the preservation of health of troops on leaving hill stations for the plains is the provision of light clothing and ample protection from heat by high and well-ventilated buildings. 14. Troops should be located as much as possible on hill stations during their service in India. I do not think frequent change of station on the plains is beneficial to the health and spirits of troops. 15, 16. No experience of hill stations. 17. There is not sufficient table-land on the hills about 15 miles distant, and which are visible from the cantonment, to enable them to be used as a sanitarium or hill station for troops, and the rain there is incessant, except for two or three months in the year. 18. I consider a sandy or laterite soil the most healthy for stations. 19. Soldiers proceeding to India should be from 18 to 20 years of age, and those destined for the Madras Presidency should land there from November to the end of January. Recruits landing in India should be kept as much as possible from exposure to sun, and from frequenting arrack and toddy shops on landing. 20. Troops should be sent direct from home depôts to India, and on arriving there should be sent at once to hill stations if possible. 21. Transit if available, travelling only by night and having the water intended for drinking boiled at halting stations the previous evening are good precautions for preserving health on the route from the port of debarkation to the interior. 22. A British soldier should serve 20 years in India. 23. Difference of opinion may sometimes exist between medical boards as regards invaliding, but I cannot suggest anything on the subject. 24. Invalids should leave India for home in the month of March.
Diseases.	1. There are weekly inspection parades for the discovery of incipient diseases. 2. There has been no scorbutus or scorbutic disease among the troops at the station. 3. There has been no case of hepatitis for a very considerable time. 4. Since joining I have not seen any cases of dracunculus; there have, however, been a few cases admitted into hospital since the arrival of the regiment here.

QUILON. MADRAS.

Reference to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	5. Venereal disease bears about the same proportion as dracunculus to the total sick in hospital, and there can be no doubt that a well-regulated lock hospital would prove beneficial to the troops and inhabitants of the town. 6. The troops at the station have suffered from— *Fevers.*—Principally intermittent of a mild type. *Dysentery.*—A few cases of a mild nature. *Cholera.*—Never been known here amongst the troops. A few cases have occurred occasionally amongst the fishermen. *Small-pox.*—Occasionally an epidemic occurs. *Rheumatism.*—Rather prevalent. There have been no deaths from any of the above diseases since the regiment arrived at this station. 7. There is nothing particular in the nosological character of the zymotic diseases that have been under treatment at this station. They are most frequent in the hot weather, and are preceded or accompanied by the hot winds. The general bazaar might, I think, be kept cleaner. The refuse of the stale dried fish particularly should be removed once in 24 hours. The native troops I consider generally healthy, as also the inhabitants of the town. 8. The duties the troops have here do not predispose to disease. 9. There has been no occasion for the exhibition of quinine as a prophylactic against malarial diseases at this station. 10. I have no recommendations to make on any of the preceding points, excepting that stated in paragraph 7, on the sanitary condition of the bazaar.
V. INTEMPERANCE.	1. The soldiers are usually very temperate. There is only one confirmed drunkard, a drummer. 2. There has been so very little intemperance at the station that no table showing the effect of total abstinence, temperance, and drunkenness, on the amount of sickness, mortality, and crime, can be prepared. Drunkenness is always punished as an offence. 3. There are no canteens, but arrack is sold in the general bazaar. I am not aware of the quantity consumed by each man, but I should not think much, as there are but few cases of drunkenness. Spirit is no part of the soldier's rations at the station, on march, or in the field. Arrack, of apparently good quality, has been given to weakly men in hospital, to the amount of one measure per diem. Except toddy, I am not aware that any other drinks injurious to health are sold in the bazaar. 4. A moderate consumption of spirits is, I consider, conducive to health and internal discipline and efficiency. 5. It would be decidedly beneficial to restrict the use of spirituous liquors as a part of the ration. 6. Malt liquor is good for the troops, and much superior to wine; nevertheless, a glass of spirits is beneficial. 7. I am not aware whether tea, coffee, lemonade, and similar drinks are much used at the station. 8, 9, 10. I do not think it would be beneficial to the health of the troops to suppress altogether the spirit ration for soldiers or convalescents, or to prohibit the sale of spirituous liquors in the canteens, and to substitute for it beer, tea, &c. No recommendations to suggest. 11. There are no bazaar regulations in force here.
VI DIET.	1 to 4. These queries do not apply to native troops. 5. Soldiers' gardens could not be established here advantageously. The soil being very sandy does not suit without going to great expense in carting good soil from a distance.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress at the station is the usual dress of the native troops. The present dress is too warm for a tropical climate, and the turbans in use with native troops are heat conductors, and consequently bad head-dresses, affording litttle or no protection, and are unseemly.
Duties.	1. The men should be thoroughly drilled at home before being sent to India. 2. The routine of a soldier's duties at the station are guards and one hour's drill in the mornings five times a week. The troops do not suffer at all in health from drills. The best hours for drills are from 5½ to 7 a.m. Marches should commence at 4 in the morning, so as to arrive at the encamping ground before 7 o'clock. The average number of nights the men have had in bed during the week for some considerable time past has been about 4½ per week, and sometimes less. 3. Guards are mounted close by the barracks. There are roll calls every afternoon at 5 o'clock. Night guards have no prejudicial effect upon the health of the men.
VIII. INSTRUCTION AND RECREATION.	1, 2. The only means of recreation and instruction at the station are a very good racket court and two native and one English regimental schools. 3. I think the institution of soldiers' savings' banks would be advantageous. 4. There is lots of shade from the large trees planted on each side of the cantonment roads and in the vicinity of the men's lines to enable them to take exercise during the day without injury to health.
IX. MILITARY PRISONS.	1. There are no military prisons, but there are several solitary cells; with the exception of three, they cannot be occupied, as they are so completely out of repair.
X. FIELD SERVICE.	1. There are no copies of regulations for field medical service at the station. 2. Any suggestion of the medical officer, as regards the conduct of the line of march of troops, bivouacking, camping, &c. is at all times attended to. 3. The sites chosen for camping grounds are as much as possible elevated and dry, and the opinion of the medical officer is generally taken upon these subjects. 4. For a native regiment one dooly per company, and two sick carts are provided for the sick on march. On arriving at the station these are returned into store and borne on the returns of the station.

Reference to Subjects and Queries.	Replies.
XI. Statistics of Sickness and Mortality.	1. There are no records at the station to provide the information under this head. The mortality of the native infantry regiment serving here at present for the last year has been only four deaths.
XII. Hospitals.	1, 2. The hospital is built on a mound, about eight feet above the level of the parade ground, the only mound in the station. It is well situated and sufficiently near to the place of arms and the men's lines. It is a considerable distance from the general bazaar. The site is very open, well ventilated, and there are no obstructions in the neighbourhood. It is generally healthy as to elevation, drainage, and freedom from malaria from all causes. 3. The water supply is ample and of very good quality. 4. A deep drain behind the hospital carries away all refuse water and impurities. 5. There is only one ward having an enclosed verandah with glazed windows in front and rear. The roof water sinks into the subsoil, and the drainage and guttering round the building is quite sufficient. The hospital appears to be built of laterite, with a brick floor, with a single roof, and there are several ventilators in the upper part of the ward walls. The walls are sufficiently thick to keep the hospital cool. The verandahs afford sufficient shelter from the sun, and being about 10 feet broad, they are used for convalescents and itch cases when the hospital becomes crowded. The building consists of one flat only.

Table of Hospital Accommodation.

Wards, Number.	Regulation Number of Sick in each Ward.	Dimensions of Ward.			Cubic Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.			Number.	Height.	Width.
1	30	Yds. 27	Ft. in. 16 6	Ft. 14	620	Ft. in. 1 3	30	In. 22·5 8·4	In. 43 37

	The hospital receives the full benefit of the prevailing winds. The windows open inwards and are conducive to ventilation and coolness. 6. The ventilation of the wards is effected by means of ventilators in the wall. The jalousies and jhilmils are of the ordinary construction. 7. The wards are cooled by means of ventilators, which are opened and shut by a pulley. 8. There are no artificial means for warming the wards. The walls and ceilings of the hospital are cleansed and limewashed once a year. 9. There are no waterclosets or urinals. The hospital privy is cleaned regularly by the two hospital toties. There are no cesspits near at hand, nor any offensive smells. 10, 11. There are no lavatory arrangements, but a large tub is furnished for the sick to bathe in. 12. The regimental dhobies arrange the washing and drying of the hospital linen. 13. The storage is sufficient and dry. 14. Iron cots are used in the hospital, which answer admirably. I can suggest no improvement. 15. There are no kitchens at the hospital. 16, 17. There are no diet tables or diet rolls in use at the station. Hospital orderlies are allowed for the sick when required. 18. The sanitary condition of the hospital is good and no epidemics have occurred in it. 19. No deficiencies or sanitary defects have come under my notice. 20. The convalescents walk up and down before the hospital, and there is ample ground in front for the same. 21. No reply to this query. 22. There are no special hospital regulations not included in the General Presidency Medical Regulations. 23. The medical officer has full power in all matters appertaining to the sanitary state of his hospital, &c. 24. There are no convalescent wards or hospital at this station.
XIII. Burial of the Dead.	1. The burial ground is near the station, but to the eastward of it. Only two Europeans have died here during the last three years; these and four East Indians are all that are buried in the churchyard. 2. The soil is sandy and dry, and I am not aware whether decomposition takes place readily or not. Drainage is not required, the ground being slightly elevated and kept clean. It is 200 yards by 190. 3. The graves are 7 feet long, 2½ broad, with an interval of 7½ feet between each; the graves are 10 feet deep, and none have ever been re-opened. Interment takes place at ordinary times within 24 hours; no epidemic is known here. 4. The burial ground is never offensive. There are no British troops stationed here. 5. The dead of bazaar people are disposed of according to castes; Mussulmans bury their dead some distance beyond the precincts of the town; the Hindoos and other castes burn theirs. 6, 7. No injury to the public health accrues from the present practice. I have no improvements to suggest in the present manner of the disposal of the dead.

(Signed) A. C. Wight, Colonel
Commanding at Quilon.

P. C. Rae, M.D.,
Assistant Surgeon, 45th Regiment
Madras Native Infantry.

9th March 1860.

BERHAMPORE.
MADRAS.

BERHAMPORE.

Accommodation. Native Troops—Infantry { Havildars - - 50; Naiques - - 50; Privates - - 700; Drummers - - 20 }

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is very open, except on the west, where it is hilly and dry; it is flat and dry towards the other points. There is plenty of water in the tanks around, and the country is jungly to the westward. 2. The station is elevated 112 feet above the level of the sea, 76 feet above the lowest ground adjacent, and 6 feet above the nearest water. There is higher but not healthier ground about three-quarters of a mile from the station. It is 15 feet higher than the present cantonment; but its superficial area is not sufficient for buildings of any extent. 3. The nearest mountain is 8 miles distant. Its height above the sea is 2,712 feet, or 2,600 feet higher than the station. 4. The nearest river is 850 yards distant. Tank water is obtainable at a distance of 200 yards. The sea is 8 miles, and the nearest marsh or tumpah 3 miles distant. The vicinity is not liable to overflow of water. There are some water pits and broken ground about half a mile from the station, the effluvia arising from which are prejudicial to health. 5. The station is open and freely exposed to the winds, except on the west, and in no way encumbered with trees, &c., &c., so as to interfere with free ventilation either external or internal. The temperature of the buildings is not raised by exposure to reflected sun heat. The station is exposed to variable winds; to cold winds from November to February, to hot winds from March to June, to south-west winds from June to September, and to north-east winds from end of September to October. They are not prejudicial to health. 6. The country surrounding the station is highly cultivated. There are several small works of irrigation at a distance of from half a mile and upwards from the station; but no particular effect on health from these has been observed. There is no prohibition to the cultivation of rice, and it is in some places cultivated close to the public road, and within a few yards of officers' houses. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The town of Bapoor lies between the barracks and the sepoys' lines; its inhabitants are Ooriahs. The town of Berhampore is about half a mile from the barracks. 8. The subsoil of the station is composed of siliceous rocks and gravel, and the surface is a light loam. The station occupies new ground never before occupied. 9. Water is usually found at a depth of 50 feet below the surface in the dry season, and from 20 to 30 feet during the rainy season. 10. The rain-fall of water from surface springs runs off into the tanks and paddy fields around. No drainage passes into the subsoil of the station. 11. The water-supply of the station is derived from wells and tanks, and is stored in open and closed tanks. The extent of tank water within the station is 33,000 square yards, and within half a mile 62,000 square yards, giving a total of 95,000 square yards. These tanks are sometimes dry during the hot seasons. The animals found in the tanks are, various kinds of small fish, leeches, prawns, a few univalve molluscs, and some small gelatinous bodies of very low organization. The plants which most abound are the æschynomene paludosa, trelumbium speciosum, species of nymphæaceæ, convolvulaceæ, alismaceæ, naiadaceæ, and pistaceæ, and among the cryptogamia species of marsileaceæ, characeæ, &c. The tanks are generally used both for drinking and bathing purposes. Only a few tanks are liable to pollution from leaves and other impurities falling into them, and one or two of the small ones within the station become very offensive in the hot season. They are not necessary, and to prevent nuisance and malaria should be either deepened or filled in. 12. The amount of tank water available for the station is 33,000 square yards, besides numerous large well-constructed wells. A great deal of the tank water is bad for drinking purposes, and has a greenish colour and peculiar smell. The water obtained from the wells, generally speaking, is not good, although clear and free from any smell, being in some places brackish, and having in others a peculiar earthy taste. It is hard, and the amount is insufficient in hot weather. The brackish water is injurious to health. The water is taken away for domestic purposes in chatties and leathern bags. A good reservoir could be made near the hills at the westward, so that water could be obtainable at all seasons. 13. No other points bearing on the health of the station suggest themselves. 14. I am not aware of the steps taken prior to the selection of a new station, and am therefore unable to offer any suggestion as to the manner in which this service should be conducted.
II. Climate.	1. The only meteorological instruments at this station are a pluviometer and an aneroid barometer, which have been only lately received. 3. The climate is variable. It may be considered a dry one from March to the middle of June, the heat from April to the latter part of June being very great. In July and August the climate is variable. September, October, and November are damp months. January and February, cold and foggy. There are occasional dust storms which do not, however, render the air impure. The health of the troops suffers from damp during the rainy season, and drilling the men on wet ground has been found to be most prejudicial to health. Warm clothing is necessary during the rainy and cold seasons. The time of drill is also changed to a later hour in the morning. During the year 1858–59, April, May, and June, were the most unhealthy months, and December, January, and February the most healthy. Fever, cholera, and beriberi were the most frequent diseases during the unhealthy months. But such is not generally the case, as the damp months September, October, and November are the most unhealthy, and fever and beriberi the most prevalent diseases. February, March, April, and May are the most healthy months. 4. I am not aware of any district near the station, the climate of which is more conducive to health than this. 5. The following is a list of stations at which I have served:—Palamcottah, Cannanore, Bellary, Kurnool, Vizianagram, Burmah, Cuttack, and Sumbalpore. The troops suffered severely from fever and dysentery at Bellary, Burmah, and Sumbalpore. I consider Kurnool an unhealthy station, but at Palamcottah, Cannanore, Vizianagrum, and Cuttack the troops enjoyed average health.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station.	1, 2, 3. Map and plan of the station and surrounding country, and plan of the barracks are transmitted. 4. Table of barrack accommodation. Total number of rooms or huts, 820. Total regulation number of non-commissioned officers and men, 10 subadars, 10 jemadars, 50 havildars, 20 drummers, 50 naiques, and 700 privates - - } 840

Number of Huts.	Regulation Number of Men in each Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet. In.	Feet. In.	Feet. In.	Feet.		Square feet.			Feet. In.	Feet. In.
10	1	31 0	10 0	10 4	3,203⅓	4,935⅚	520	No rule.	2	1 6	1 6
		20 0	10 6	8 3	1,732½				3	1 6	1 6
10	1	30 0	10 0	10 4	3,100	3,100	300	do.	2	1 6	1 6
50	1	30 0	10 0	8 7	2,575	2,575	300	do.	—	—	—
50	1	18 0	13 3	8 10	2,106	2,106	238½	do.	—	—	—
20	1	30 0	10 0	10 4	3,203⅓	3,203⅓	300	do.	2	1 6	1 6
700	1	11 6	9 0	7 7	784⅝	784⅝	103½	do.	—	—	—
Guard room	18	35 3	16 0	17 10	10,058	558⅞	564	do.	5	5 3	3 9
Prison cells -	1	8 0	8 0	10 4	661⅓	661⅓	64	do.	2	1 6	3 0

5. Windows are built in the barracks generally on one side only, they are open ones with wooden bars. Verandahs also are only on one side, they are 3½ × 13 to 30 feet in length, according to whether it is a subadar or other rank. The verandahs of sepoys' quarters are sometimes during the hot season occupied as sleeping quarters by them. There are no jalousies or jhilmils.
6. Sepoys use the common native cots in their huts; but when in tents they sleep on the ground.
7. The tents are made of canvass three layers thick. They are very small, being only 25½ feet long, 15 feet broad, and 9¼ high, supported by two poles, the ends forming an exact cone, and the sides a triangle. The cubic space is 1,273 feet, and the superficial 333½ feet, which gives for 25 men 50$\frac{22}{25}$ and 13½ respectively. This calculation is made when the small fly is extended outwards as far as possible.
8. The means of ventilation are doors and windows only, and these in tents or huts are certainly insufficient. There are no barrack-rooms at this station.
9, 10. The only barracks at the station are places of arms. Tents are made of canvass, and huts are constructed of mud walls and tiled roofs. The floors are made of earth, and smeared with cow-dung, and are slightly raised; but there is no passage of air beneath.
11. The tents should be larger, and the huts of a better description, with windows, and higher. The repairs to barracks, &c., are executed by the department of public works. The officer commanding the station is responsible for the general sanitary state of it. The walls and ceilings of barracks are cleansed and lime-washed whenever required.
12, 13. There are neither lavatories, cook-houses, or conveniences for washing and drying linen at this station.
14, 15. There are neither privies nor urinals at present; but the erection of some is in contemplation.
16. The barracks being merely places of arms are not drained. No part of any building is used as a barrack or hospital. There are foul ditches in the native town of Berhampore, about one mile from the cantonment.
17. The surface cleansing of the cantonment is inefficiently done, there being no means at present provided, and the refuse manure, &c., being in many instances deposited in front of the native houses.
18. The surface of the cantonment is kept free of vegetation. The Ooriah village before mentioned as lying between the barracks and sepoys' lines, considerably interferes with the ventilation of the latter, but there are no old walls or hedges.
19. The bazaar is drained and ventilated, and there is a good supply of water; but it is not used for drinking. There are no latrines, and the place is dirty and crowded. There are no regulations at present for preserving cleanliness in the bazaar, and no sanitary police; it would be most desirable that such be appointed. The general condition of the native houses is poor, and there are dung-heaps in and about many of them. No nuisance is experienced in the sepoys' lines from wind blowing over the native dwellings.
20. Animals are slaughtered about half a mile from the station at a place appointed, and the offal is disposed of to persons of very low caste. Nuisance is experienced by the neighbouring residents, but not in the station itself, the only means of preventing it would be the erection of a slaughtering-house.
21, 22, 23. No answer to the question.

Officers' Quarters.

1. The officers' quarters at this station are not very good, but they are drained and well ventilated. They would be greatly improved by the prohibition of the cultivation of rice in their immediate proximity.

IV. Health of the Troops.

1. The station and district generally speaking is healthy, but the adjoining native population sometimes suffers severely from epidemics of cholera and small-pox.
2. The principal diseases which occur among the native population are beriberi, rheumatism, syphilis, and fever. Small-pox and cholera occur generally once a year epidemically, spleen disease is not at all prevalent.
3. The healthiness of the native population would be much improved if the houses were better ventilated, kept cleaner, less crowded together, and the number of occupants to each house reduced. The streets also require to be wider and kept cleaner, and means might be adopted for removing the heaps of various kinds of filth which are accumulated in the streets to some appointed locality beyond the town.

BERHAMPORE. MADRAS.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	4. The regiment left Burmah in 1854, having been stationed there for two years, and having suffered greatly from fever, dysentery, and rheumatism. The state of their health on arriving here was much impaired by their residence in Burmah. The regiment arrived here in 1854, and the diseases from which the men have suffered since that time have been fever, beriberi, and rheumatism. All parts of the lines are equally healthy. 5. The troops are never camped out, except in cases of sickness. 6. I have never had charge of troops at hill stations. 7 to 16. No answer to these questions. 17. There is no higher ground near this station which could be used as a hill station. 18. No reply to this question. 19. I consider the best age for soldiers to proceed to India to be from 22 to 25 years of age. 20 to 24. No replies to these queries.
Diseases.	1. There is only a weekly inspection of recruits at this station for the discovery of incipient diseases. 2, 3, 4. There has been no scorbutus at this station, and cases of hepatic disease among native troops are exceedingly rare. Dracunculus does not occur at this station. 5. The proportion which those sick from venereal diseases bear to the total sick is about 10 per cent., and this disease almost always occurs among recruits; the weekly inspection of these suffices as far as possible for the discovery of incipient disease. A well regulated lock hospital would be advantageous. 6. The following are the diseases from which the troops at this station suffer:— *Fevers.*—The troops suffer constantly from fever. Quotidian intermittent fever is the prevailing form, and next to that ephemeral fever, small-pox and chicken-pox. *Dysentery* seldom affects the troops, and is generally speaking mild in its attack. *Cholera* generally occurs once a year epidemically, and affects the troops as well as the neighbouring population. *Small-pox.*—The troops do not suffer much from this disease. *Rheumatism.*—The troops suffer from chronic rheumatism, but very often it has been acquired elsewhere. The proportion which admissions from the above diseases bear to the total admissions is not quite 1 to 3; but the proportion which the deaths from these diseases bear to the total deaths is a fraction over 1 to 3. 7. The more frequent zymotic diseases are feb. quotidiana intermittens, feb. ephemera, cholera epidemica, variola simplex, varicella. Quotidian intermittent fever is prevalent during both the hot and damp months. Cholera occurs during the hot months. Small-pox and chicken-pox indifferently. These diseases are preceded by no particular climatic or atmospheric conditions, with the exception of cholera, which most frequently occurs during the hot weather, and during highly electrical states of the atmosphere. Cholera appears to occur as frequently in those localities which may be considered as most cleanly as in those of a contrary description; whereas the other diseases prevail most in those parts where there is overcrowding of dwellings, and the general sanitary condition is bad. The extensive use of bang and opium, ultimately leading to a debilitated state of health, insufficient and impoverishing food often badly cooked, the use of unripe fruit, and the overcrowding of huts where there are large families rendering the atmosphere impure, all tend to predispose to disease. 8. The nature of the sepoys' duties in garrison does not seem to influence the prevalence of epidemic disease. On the march the practice of eating cooked rice in a cold and stale state, the drinking of water procured from the nearest point, and which is frequently unwholesome, their being without food for many hours in consequence of the non-arrival of the bandies, together with the fatigue of marching, influence the prevalence of disease. 9. The prophylactic value of quinine against malaria has not been tried at this station. 10. It has been frequently observed that cholera has been brought into the station by pilgrims returning from Juggernauth, that disease at the time raging there. Could these people be prevented from entering the station by any arrangement, the incursion of the disease might to a certain extent be prevented. As regards the mitigation of epidemic disease, the great point to attend to is the complete sanitary condition of the station.
IX. MILITARY PRISONS.	1. The cells at this station are well constructed, and answer the purpose for which they are intended.
XII. HOSPITALS.	1. A plan of the hospital is transmitted. 2. The hospital is half a mile from the barracks, situated out of the limits of the cantonment, and in the vicinity of a few houses occupied by civilians. There is no bazaar near it; but there are a few houses on the east side of the hospital, which interfere with its ventilation. The site is healthy in every respect. 3. The water-supply is sufficient, and is considered good by the sepoys. It is, however, obtained from a tank, which is used for washing as well as for drinking purposes. 4. The refuse water and other impurities from the hospital are removed by means of a common drain, from which no effluvia arise. 5. The floors of the lowest wards of the hospital are raised above the ground 1½ feet; but there is no perflation of air beneath them. The roof-water and rain-fall flow into side channels, which are on the public road, at 40 yards distance from the hospital, and which are sufficient to carry them away. The roof of the hospital is double, with ventilation between; the walls are of brick and chunam. The hospital is sufficiently cool, with verandahs on both sides of the breadth of six feet, which afford sufficient shelter from the sun's rays. The verandahs, during the cool part of the day, are used by those able to walk about. The hospital consists of one flat only.

References to Subjects and Queries.	Replies.
XII. Hospital—*cont.*	Table of Hospital Accommodation. Date of construction—unknown. Total number of wards - - - - - 2 Total regulation number of beds - - - - 49

Number of Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet. In.	Feet. In.	Feet. In.	Feet.		Square feet.	Feet. In.		Feet.	Feet.
1	25	78 6	19 6	16 3	24,875	995	61¼	1 8	8	4	3
1	24	77 0	19 6	16 3	24,399	1,016½	62½	1 8	8	4	3

The hospital receives the full benefit of prevailing winds, except on the east side, where there are some scattered houses. The windows open inside, and in addition there are jalousies which open on the outside.

6. There are no special means of ventilation, but the amount afforded by the double roof, doors, and windows is sufficient. The lower part of the jalousies is panelled, and the upper part has venetians of the usual pattern.

7, 8. There are no artificial means either for cooling or warming the air admitted into the wards. The walls and ceilings of the hospital wards are cleansed and limewashed when required.

9. A plan of the privies is transmitted. They are 36 feet from the hospital, and are constructed of brick and chunam, with tiled roofs. They are kept clean by sweepers, and are not offensive.

10, 11. There is no lavatory attached to the hospital; but a large bathing tub, a hip-bath, and a foot-tub are allowed for the use of the sick, and, generally speaking, they are sufficient.

12. One dhobie is attached to the hospital, to look after the cleanliness of the linen.

13. The storage is sufficient and dry.

14. Some of the hospital cots are made of wood, and others of iron. The bedding consists of one paillasse, one quilt, and one pillow, with pillow case, to each patient. All the bedsteads should be of iron.

15. There is no kitchen for the use of patients, but there is one for hospital purposes.

16. Copies of the present forms in use for keeping the statistics of sickness, mortality, and invaliding in the corps are transmitted.

17. One hospital havildar is in attendance, and, when it is considered necessary, an orderly is allowed to attend upon a patient.

18. The hospital is clean, well ventilated, and healthily situated. No epidemic disease, hospital gangrene, or pyæmia has ever appeared in the wards.

19. I have no improvements to suggest.

20. The convalescents take exercise in the verandahs during the cool of the day, and are occasionally allowed convalescent leave to their houses.

21. This question is not applicable to native troops.

22. There are no special local hospital regulations not included in the General Presidency Medical Regulations.

23. The medical officer has entire control over the sanitary state, &c. of his hospital.

24. There are no wards or hospital for convalescents at this station. If a sepoy requires some time to recover from a disease, he is sent on sick certificate to his native village or some advantageous place. If they require a short period of convalescent leave, they are allowed it in the lines, but they have to come to hospital either daily or as directed, to see if they are making any improvement.

XIII. Burial of the Dead.

1, 2. The burial ground is distant 884 yards from the station, and to the south-west—the direction of the prevailing wind. Its area is 1,936 square yards; its soil light loam, and subsoil gravel.

3. Rules for out-station cemeteries (M. G. O., 5th May 1857) provide that lines 10 feet apart, parallel with the paths, should be marked out, within which all graves should be dug, care being taken that the graves are as near together as may be conveniently practicable. The depth of the graves is at least five feet. Graves have occasionally been re-opened for laying the foundation of tombs over them, but never for other interments, nor would there be occasion for any such practice at Berhampore. If a death occurs at a very early hour in the morning, interment would, usually, take place about sunset of the same day; if about noon, interment would not take place till about sunrise of the next day; and if at an advanced hour of the evening, burial would probably have to be deferred until about sunset of the next day.

4. The grave yard is never offensive.

5. All natives are (according to caste) either burnt or buried.

6, 7. Injury to the public health does no doubt accrue from the present practices. Bodies being often buried within two feet of the surface, wild animals consequently disinter them, and the effluvia from these must necessarily be injurious. The graves should be ordered to be dug deeper, certainly not less than four feet (?).

(Signed) Arthur Wyndham, Major,
5th regiment N.I., commanding Berhampore.
G. H. Alexander, M.D.,
Assistant Surgeon D.D. 5th regiment M.N.I.
J. E. Hopkins, Sub-Conductor,
Executive Agent, D.P.W.

May 5, 1860.

HURRYHUR.
MADRAS.

HURRYHUR.

Accommodation. Native troops. Infantry, 16th regiment Madras Native Infantry.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is for the most part a champagn country, with a few surrounding villages sparsely scattered here and there. There are very few trees except in the immediate vicinity of these villages. The country is for the most part flat, with a decided and rather steep slope towards the river on the west (with a gradual rise beyond it), and towards the cultivated ground on the north. There is at a varying distance on the north, commencing about 3 miles off, an irregular succession of low hills, seeming to pursue no particular or uniform range. On the east and south the country is for the most part level and open, with hills appearing on the horizon. At a distance of 3 miles in a south-easterly direction are three detached hills about ½ a mile apart, assuming a range E.S.E. & W.N.W., the most easterly being about 300 feet high, and the others about 150 or 200. On the S.W., at a distance of about 25 miles, is seen a range of hills lying S.E. and N.W. The soil generally is dry. There is very little wood, jungle, or water, in the vicinity of the station, save in the immediate neighbourhood of the river, and a few tanks, not one of which is within two miles of the station. 2. The elevation of the station is 1,831 feet above the level of the sea, but can hardly be said to be elevated above the adjacent country, save as regards the before-mentioned slope. The highest part is probably about 50 or 60 feet above the water level of the river at this season (January). The river after the month of June, and between that and October, has its level raised probably not less than 20, and may occasionally be 30 or more feet higher than it is now, for a day or two. I know of no higher or healthier ground adjoining the station. 3. The nearest table lands are: the Babadbooder hills and Mercara, lying south by west from this station, both at a considerable distance. The former is of inconsiderable extent, but believed to be very salubrious, and is over 4,000 feet above the sea. The latter is very salubrious, of large extent, and considerable elevation (4,506 feet), on the Western Ghauts; it is visited by much rain during the south-west monsoon. Davaroydroog and Nundidroog lie to the S.S.E., distant about 140 miles, but are of inconsiderable extent, and are both visited in hot weather by such as can find accommodation on them. The latter is 1,500 feet above the plain, or 4,856 feet above the sea. Ramandroog, on the Ramee Mullay hills, lies N.E. by E., and is about 200 miles distant. It is 3,100 feet above the sea, but of considerable extent. The Neilgherry hills, much more distant, and lying S. by E., I need only advert to, *en passant*, as they are so well known. 4. The station is distant about ¾ of a mile from the right bank of the Toverbuddra river. The lower ground to the N.W. is occasionally, but rarely, subjected to overflow, except in unusually long-continued or heavy falls of rain during the S.W. monsoon. This, however, lasts at most for 2 or 3 days only, as from the continuous slope towards the river it subsides with the subsidence of the body of water in the river bed. There are no ravines or broken ground in the close vicinity of the station, but there are, here and there, ravines running to the west into the river. They do not seem in any way calculated to affect the health of the station. 5. The station is sufficiently open to all the usually prevailing winds, and there seems to be no redundant growth of trees or hedges sufficient to interfere with free external or internal ventilation. As regards the sepoys' lines, it would have been better had they been constructed with wider streets, and had the men not been allowed, from time to time, to build other than the original huts within the enclosure originally allowed for each sepoy's hut. As regards the bazaar lines, many interlopers have from time to time occupied and built houses on ground which should have been left open on the west, and thus the access of wind from that quarter is prevented to the sepoys' lines. From the nature of the soil of the station, there is comparatively little reflected sun heat to operate in raising the temperature of the station. The winds generally are neither cold nor variable, and the more prevalent are from the N.E. and S.W. at the seasons respectively constituting the corresponding monsoons. There are occasionally westerly winds towards the after part of the day, which are generally agreeable, and are usually looked upon as sea breezes. The north-east and east winds, which usually blow in the early part of the year, are mostly hot and dry, and rather prejudicial to health, where people heedlessly expose themselves to their direct influence. 6. All the surrounding country which admits of it profitably is under cultivation. The immediate vicinity of the station is closely cropped with indree, cotton, millet, or dhall. The cultivation is permitted to be carried on in rather too close proximity to the men's lines and bazaar lines on the south and west. The men are in the habit of going into these fields for the relief of nature, and while such practice is allowed, there should be some considerable space of intervening ground free from cultivation, whereas, in the direction designated, there is none. There are no works of irrigation in the immediate vicinity of the station. There is no rice cultivated within some miles of the station that I am aware of, but I do not know that there is any prohibitory order. No indigo is grown near here, nor hemp with a view to the preparation of "jute." The linseed planted is cultivated within a few miles for the oil prepared from its seeds, but no flax is prepared from its stalks. There is no nuisance experienced from this. 7. The town of Hurryhur is situated 2 miles to the south west of the cantonment; its population is by no means numerous. 8. The surface soil is for the most part "regur," or "black cotton," resting on red stiff gravelly earth (with a clayey matrix) which here and there constitutes the surface soil (in the more elevated parts) and is in some parts very stony and barren. Beneath there are found syenite and granite rocks here and there outcropping on the surface. 9. Water is usually found about 40 or 50 feet below the surface, whether in the dry or rainy season. The greater number of the wells furnish water, which is considered unwholesome from the earthy salts with which it is impregnated, and which also make it hard and unfit for washing purposes where soap is used.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	10. The rain fall of the surrounding district seems readily to flow away. The subsoil seems comparatively impervious; consequently, wherever any hollow exists, water lies on the surface until it evaporates; but as before stated, from the cantonment being situated on ground sloping off especially to west and north, there is no lodgment in its immediate vicinity of any consequence at any time. No drainage from higher ground passes into the subsoil of the station. 11. The water for drinking purposes is almost exclusively procured from the river. There are two very fine wells in close proximity to the hospital; but the water is not used for drinking, only for cooking and washing purposes. There are several wells in the compounds of officers' houses, and a few in the lines, some of which furnish water to a limited amount, considered fit for drinking. The tank nearest the station is two miles distant, to the east, and on a somewhat lower level; it is not a source of nuisance. 12. The supply procurable from the river seems unlimited, as even were its bed to all seeming dry, it would be easily obtained at a foot or two at most, by digging. It is, except when at flood, transparent, tasteless, colourless, and inodorous. During the rains it becomes tinged with varying depths of yellow or brown; but this subsides readily on standing, and becomes fit for use after boiling or pouring it through the rough filter in common use in every house in India. It may be inferred that its composition is that of ordinary pure water. It is perfectly soft, devoid of microscopic characters, of good quality, by no means injurious to health, and is sufficient in quantity. The men have the water of the river brought in chatties by the females of their establishments, or employ servants for that purpose. Officers employ "puckallies," who bring it up to cantonment in leathern bags on bullocks. The experimental results of sinking wells are so unfavourable to a reasonable expectation of getting pure water for drinking purposes, that it is doubtful if better water could be obtained than that from the river. 13. No answer to this question. 14. I am not aware of the existence of any definite orders or rules for guidance in reference to the service of selecting sites for new stations, unless the issue to each medical officer on entering the service of the small manual (on Medical Topography) under order of Supreme Government, 22d February 1836 be viewed in such light. Never having been employed on such duty, I know not the amount or kind of inquiry or examination usually looked for, but I am under the impression that usually the report of an engineer officer as to the capabilities of the place is first called for, and, if his report be favourable, that a mixed committee (having one or more medical officers with others) is appointed to examine into the merits or capabilities of the site as already reported on by the engineer officer. I am aware that recently one of the duties of the Inspector-General of Hospitals is supposed to be the making himself familiar with (and reporting on) the topographical and other peculiarities of elevated table lands, as to their adaptability for sanitaria, or for the location of bodies of Europeans. I have not seen or heard of any rules for his guidance, or any that may have been adopted or devised by himself for that purpose. I know also that before the abolition of the medical board inquiries of the kind above adverted to were set on foot in reference to the station of Secunderabad, the barracks having been condemned by some medical officers of Her Majesty's British troops, and the selection of a sanitarium on the eastern coast; but I have not seen published any memoranda of proceedings recommended or adopted on those occasions. The Ramandroog sanitarium was selected as such after the report of a medical committee convened in 1846 to investigate and report on its suitability.
II. Climate.	1. From a comparatively recent period (I have no record of it anterior to June 1857) there has been an aneroid here. In January 1859 thermometrical observations were commenced, and last November only a wet bulb thermometer was furnished in addition to the other; there is also one of Newman's rain guages, but these are the only meteorological instruments at this station. 2. The few means and limited period of observation preclude the formation of a table of much value.

Table of meteorological observations from June 1857 to January 1860:—

Months.	Barometer Mean.	Mean Temperature.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain.	Winds. Direction.	Remarks.
		°	°	°	°	Inches.		
January - -	27·840	74	74	63	102	—	N., E.	
February - -	27·794	79	—	—	92	—	do.	
March - -	27·841	81	—	—	96	0·1	S.W.	
April - -	27·818	81	—	—	91*	0·55	do.	* There must have been some mistake in recording the observations for these four months.
May - - -	27·701	84	—	—	94*	0·407	do.	
June - - -	27·689	81	—	—	88*	0·84	do.	
July - - -	27·651*	79	—	—	89*	0·265	do.	
August - -	27·692	78	—	—	92	0·98	do.	
September - -	27·738	79	—	—	97	0·129	do.	
October - -	27·786	80	—	—	100	0·510	do.	
November - -	27·762	78	78	68	98	0·106	do.	
December - -	27·819	76	76	65	102	—	N.E.	

3. It seems mainly in its features to be a dry climate, with a considerable diurnal range of temperature, especially in the cold months of the year. In all essential respects, however, the atmosphere seems to be pure. Neither has the regiment, nor have I, been here long enough to justify a decided opinion as to the actual influence of the climate on their health, but I should think that with care it must be beneficial to troops coming from the relaxing climate of the coast. In the cold months they require warmer clothing and good shelter. The only precautions necessary as to drill are not to begin too early in the cold months, nor at any time to keep the troops out too late in the morning sun. Cloth trousers and boat cloaks become essentially necessary for night duties, and the former for early parades. From my own experience I cannot pronounce an opinion as to the most unhealthy months at this station, and the residence of the regiment here is too short for observation. From

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	the hospital records of the twelvemonths during which the regiment has been stationed here, the following months in the order named seem to have been the most unhealthy:—January, November, June, October, May, February, and September, and the most prevalent disease has been fever, with cholera in the months of January and June. 4. I do not know of any district near the station the climate of which is more conducive to health than that of this station. 5. The following is a list of stations at which I have served, with my remarks on their comparative salubrity:—I have done duty at Madras, Belgaum, Vingorla, Secunderabad, Seetabuldee (Kamptee), Quilon, Cuddapah, French Rocks, Bangalore, and Hurryhur. I arrived at Madras in June 1840, and served at the General Hospital till November of that year. I suffered much in my own health in acclimation, but others my comrades did not in the same degree. Leaving Madras in November 1840, I proceeded viâ Bangalore, Hurryhur, and Dharwar, to Belgaum, where I arrived in January 1841, and served with left wing H.M. 4th (King's Own) Regiment. In the early part of that year, during the south-west monsoon, I went on field service with portions of that regiment to Neepanee and Baddmee. At the close of this year I went to Vingorla (for about four months) in charge of invalids of that corps, about to proceed thence for England, and I returned to take charge of the wing. My duties were principally with the corps of which I had occasionally medical charge, and eventually left Belgaum in charge of it. This corps suffered much in health in the climate of Belgaum. There were many deaths from fever with cerebral complication, from dysentery and from diseases of the liver. I feel more inclined to think intemperance the prime cause of these attacks than mere climate; yet I believe the men were not sufficiently controlled in their movements, consequently they exposed themselves too much to the sun, whilst, on the other hand, sufficient interest was not taken in their welfare to provide for them amusement or recreation of kinds calculated to lessen their disposition to wander abroad. With due care and ordinary precaution as to suitable dress in the monsoon, and avoidance of undue exposure to sun, I consider the climate of Belgaum very good. I marched from Belgaum, in medical charge of left wing of H.M. 4th (King's Own) Regiment, in latter end of October 1842; our original destination was Kamptee, but, after having got within ten days' march of it, our march was countermanded, and, after three weeks' halt on the north of the Wurdah, we started south for Secunderabad. We arrived in middle of March. In this long march the men were under canvass for nearly five months. Their excellent health formed a strong contrast with that of the previous five months. During the march one death alone occurred (from cholera). In cantonment the deaths monthly were (as nearly as I can now recollect) 3 to 6 or 7. I was stationed in Secunderabad till latter end of October 1843, during which time I suffered much in health, from suppuration of enlarged cervical glands and general rheumatism. The regiment (H.M.'s 4th King's Own) suffered severely in health in that station; many deaths from hepatic abscess, dysentery, and diarrhœa. In addition to more or less of similar influences, above adverted to as having probable existence in Belgaum, I believe the construction of the barracks, and its site (both since abandoned, but long before condemned) had much to do with their bad state of health. The site was, in my view, a powerful instrument to mischief. I entertained the impression that the wells of water were contaminated by the burial ground, situated in close proximity and on higher ground. Troops in other parts of the station enjoyed good health, and I believe it is, generally speaking, a healthy station. In October 1843 I left Secunderabad, and proceeded viâ the Neermul jungle to Kamptee, which place I reached in latter end of November. Soon after my arrival I was attacked by fever, in all probability contracted on my journey. This degenerated into a most obstinate and severe intermittent, of very irregular character, and eventually, in the month of April, I was attacked by severe inflammation of right knee joint, by which I was confined to bed for five months, during which my life was despaired of, if my limb were spared. I was compelled to return to Europe on sick certificate. I embarked at Bombay on 1st December 1844. It was thought I should have to undergo amputation above the knee. My own sickness and its sequlæ were contracted *in transitu* to Kamptee; but during my residence at Seetabuldee the deaths, especially from fever, among Europeans, both men and officers, were very numerous. So far as I can judge, the principal causes are the great diurnal range of temperature, and the great power of the midday sun at that station. I am inclined to think the bed of the river Kannar, which skirts one side of the cantonment in its entire length, is a more fruitful source of malaria than is generally attributed to it. I embarked at Gravesend, on my return to India, in good health, with an anchylosed knee joint, in charge of recruits, on 1st May 1847. The principal portion of these recruits consisted of those from the famine districts in Ireland. I arrived at Madras in August (19th). On 12th September 1847 I left Madras by sea for Quilon, where I arrived on 19th September, and did duty in that station with 16th Regiment Madras Native Infantry till May 1850. I consider that station a very healthy one. Natives on that coast generally suffer much from cutaneous disease, which I believe attributable in large degree to the large consumption of carelessly dried salted fish. My next station, Cuddapah, was reached by me on 1st June 1850, the journey being performed partly by sea to Madras, and thence by land. During my stay in that station, my own proper duties were civil, but, during my protracted stay (seven years) I had the opportunity of seeing the effect of its climate on four native regiments, of one of which I had the charge for nearly a year, in addition to my own duties. The climate appeared to agree very well with the men of three of those regiments, and especially with those of the 37th Grenadiers. The men of the 52nd Regiment Native Infantry formed the exception, and, although the having charge of them enabled me to enter fully into enquiry, I was unable to arrive at an explanation of their suffering in health so much more than other regiments. It is true while they were there the lines were destroyed, or nearly so, by a flood, and they had to form new lines; and it may be that this was sufficient to account for it. I could assign no other reason. There was also some difference in the health of the European officers of those regiments. Of those belonging to one there were many passionately fond of "Shikar," who lost no opportunity of being out in pursuit of that recreation. The officers of the next regiment

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	were not generally so fond of out-of-doors amusements, and they suffered more in health, as I thought in consequence. The officers of the regiment that next came had some improvements made in their houses, which, in some degree, perhaps had a favourable effect on their health, and the last regiment adverted to had the benefit of similar houses. As a general rule, however, most of those who could afford to do so, or who had the opportunity, were in the habit of getting away from the station during the very hot months. For the marked peculiarity of the station at that season is the excessively hot arid atmosphere, with the perfectly still motionless condition of it all night, rendering it almost impossible to sleep unless under a punkah or thermantidote, or what was, in the absence of either, tried for a limited period of time, in my own case, the having water copiously and frequently thrown over the flooring of the bed room, to lower temperature and lessen dryness of the atmosphere. As regards the effect on the covenanted members of the civil service, some of them were always able to pass the hot months on the neighbouring hill at Mudnapully, and of the others large houses, courts, or cutcherries, cooled by wetted kuskus tatties, and the use of punkahs, or thermantidotes, enabled them to bear up against the climate of the hot season better than the officers in the limited houses of the cantonment could be expected to do. A marked peculiarity, in regard to the station of Cuddapah, almost I believe from time immemorial, was the frequent occurrence of epidemics of cholera, by which the inhabitants of the town and the prisoners in gaol were attacked, and the like frequent recurrence of it in the regiments stationed there. In this latter class I strongly suspect it was most frequently contracted by people who had been in the town, and, having once appeared in the lines, it spread there, as elsewhere, by a process allied to the fermenting, or other not yet fully ascertained or determined. Its frequency in the goal and town, so far as my own experience allows me to form a judgment, was, I believe, very largely, in fact principally, due to want of proper sanitary arrangements, and probably actual defiance of all such measures. Prior to my arrival steps had been taken to open up the town and form good roads through it. This and the forming better drains, and enforcing cleanliness of them as far as possible, were being kept constantly under consideration, both in the town and in the gaol, after my arrival. Cholera for the last three years of my stay in that station was hardly known, except as a sporadic case, or where pilgrims, from Nigrutty or elsewhere, seemed to have contracted the disease at that place, or *en route* from it. It might be almost said to have disappeared from the gaol, and this attributable mainly, I think, to greater attention to the quality of food issued, and the other points above adverted to. One (the last) outbreak has been indelibly impressed on my memory. I succeeded, after careful searching out for its possible cause, in discovering that a large accumulation of refuse of all kinds had been allowed to form for months in rear of the gaol. I had pointed out the necessity of clearing this away and preventing formation of any such accumulation for future, and been informed that its removal would occupy a period of three weeks. Meanwhile the river suddenly and unexpectedly came down, and, after some difficulty, I succeeded in getting permission to cast the whole heap into the river at once, as the quickest, safest, and most useful way of getting rid of it (most useful as, by means of an anicut, it would be carried into a large tank below the town). Such was the dreadful effluvium which spread abroad from it during its removal, that the collector could not sit in his cutcherry that day, but the whole was got rid of, by dint of energy, in *six hours*. Cholera ceased almost immediately, and was hardly known in the gaol again. Intermittent fever is unusually prevalent occasionally in Cuddapah. Much of this due perhaps to the peculiar mode of manuring indigo ground, and not a little to the almost universal habit of keeping all the refuse filth close to every house, till the season comes for spreading it abroad on the field, instead of the daily or periodical removal of it outside the villages. My own duties abroad, occasionally very extensively so, involved much unavoidable exposure at all seasons. The effect was very trying to a constitution naturally strong, yet I never left it in the hot season, but remained continuously at duty till beginning of 1857, when I was attacked by remittent fever, which necessitated a temporary absence on sick certificate to Bangalore. I left Cuddapah in beginning of April 1857, and arrived in Bangalore the same month, and staid there till July, but found the climate most unsuitable to me, after so long a stay in Cuddapah, so gladly proceeded to French Rocks in latter end of July. I remained at the French Rocks till December of the same year with the 20th Madras Native Infantry. With the exception of an attack of epidemic cholera, preceded by one of small-pox (both of which had subsided before my arrival), the only peculiarity noticeable in the state of health of that regiment was the apparently unusual proclivity to attacks of intermittent fever. This I believe attributable to the close proximity of a large shallow tank coming down rather closely on the left flank of the sepoys' lines, with insufficient means of screening them from the wind blowing over the tank, and carrying malarious atmosphere through them. Where the men and their families were in the habit of drawing water out of the shallow parts of the tank—where, from the daily receding of the water under the influence of evaporation, vegetable matter was left exposed to insolation and decay, and in this way the water itself might become impregnated—while the persons going for it were continually breathing the atmosphere contaminated by gaseous exhalations from the decaying vegetable matter. In December 1857 I left French Rocks, returning to Bangalore at end of the month with the 20th regiment Madras Native Infantry. Here, from its arrival, the regiment began to suffer much from fever. It might have been partly due to their having recently only come from the moist, mild, enervating climate of Cannanore, combined with an unusually large increase of duty necessarily attaching to their being the only native regiment then in Bangalore. To lessen the amount of labour, ball practice parades were left off, and eventually nearly all parades. Still fever gained rapidly, and eventually nearly two hundred men at a time were in hospital with it. With a view to determine how much the state of their lines might have to do with its causation, a minute examination of the house and enclosure of each sepoy was made. They were found not to be in so good a sanitary condition as could be considered desirable, from

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	overcrowding, insufficient ventilation, insufficient sewerage and cleanliness, but yet this alone would not seem, as compared with a similar state of things in a regiment near them, sufficient to account for it. Their health continued for many months thus bad, and at length a change of station was recommended to Nellore, and has recently been carried into effect. I left Bangalore in June 1859, on removal to the 16th regiment Madras Native Infantry, stationed at Hurryhur, where I arrived in same month, and need say no more here regarding this station, as notes regarding it are forwarded herewith elsewhere. HENRY PETER RICE, M.D., Hurryhur, 1860. Surgeon, 16th Regiment M.N.I.
III. SANITARY CONDITION OF STATION.	1, 2. It is impossible to transmit a general map and plans of this station and the surrounding country, as there is no one from the Engineer or Public Works Department on the spot available for the purpose. 3. The construction of the barracks is similar to that of the hospital, differing only in having no top ventilation and the verandah being deeper, continuously enclosed round its south end, not at all at the other, and having no enclosed area in its rear. 4. The building used as a "Place of arms" for native regiments is usually designated by sepoys "The barrack," but correctly speaking it is not a barrack. The following table shows the prison cells' accommodation, &c. at this station.

Number of Prison Cells.	Regulation Number of Men in each Cell.	Dimensions of Cells.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
Two solitary.	1	Inner Chamber. Feet. 8	Feet. In. 8 2	Feet. In. 16 6	1522	1522	94½	—	4, and 1 door. 1 folding door.	4 feet	1½ feet.
		Outer Chamber. Feet. In. 3 1	Feet. In. 9 7	Feet. 12							

5. There are no windows except to the guard room, native officers' rooms, prison, and solitary cells. In the first of these they are placed on adjacent sides, in the second and third on one side, and in the last on all four sides. The principal part of the barrack building is used as a place of arms, and has 14 doors. There is a verandah of 9¾ feet wide all round, but this is enclosed at the south extremity, and for about 40 feet on the west, and 20 feet on the east front, for use as native officers' room, guard room, and prison. There are no jalousies or jhilmils to the place of arms proper, only slab doors.
6. No bedsteads are allowed for native troops except in hospital.
7. The tents are made of stout cotton cloth—threefold—the innermost, indigo dyed. They are 22 feet long, 12 broad, and between 11 and 12 feet high. This would give a cubic space and superficial area per man respectively of 60 cubic and 10½ square feet; but they have more, because some of the number of men allowed for each tent are absent on duty, and on ordinary marches, and others are probably sleeping with their families.
8. No means of ventilation are used for the quarters, &c. of the native army.
9. The walls of huts are usually built of well kneaded mud or clay, or of sunburnt bricks. The roofs in some lines are thatched with straw, grass, cocoa-nut, or palmyra leaves, in others they are covered in with tiles. Occasionally the roofs are terraced or "dhaba" with well beaten tempered clay.
10. Usually the floors of the huts are raised above the ground, but it in few instances exceeds two or three inches, there is no fixed rule. They are for the most part made of well tempered clay, but the floor of the place of arms (or barrack) is flagged with stone. There is no passage of air underneath.
11. As regards the general plan of construction of native lines, they should have a larger plot of ground allotted to them so as to admit of wider streets, and a larger enclosure being allowed to each of the huts, as the number of followers attached to the men involves the necessity of building other structures in their several enclosures which prevents generally free circulation of air, while it crowds too many people into spaces too limited for their accommodation. Barracks and important works in the cantonment are kept in repair by the Department of Public Works, and the repairs are usually tolerably quickly executed. Medical officers have generally considered it their duty to see to the sanitary state of their own part of the cantonment and its vicinity; but prior to the issue of G. O. C. C. of 26th August, 1856, and 3rd November, 1856, by Lord Clyde, such was not officially considered to be their duty. Regimental quartermasters were, as still, held responsible for their respective lines being kept clean. Being only used as a place of arms, the barrack walls are cleansed and limewashed once in two years.
12. There are no lavatories at this station for the use of native regiments.
13. There are no means of cooking. The washing and drying of the linen is done by native dhobies, whose services seem fully adequate to what is required of them.
14, 15. There are no privies or urinals at the station. It has been before suggested by me, that such conveniences should, where available space was procurable, be erected in all native lines; and the question has been again more recently adverted to in paragraph IV. of letter No. 2,777 of deputy quartermaster-general of Fort St. George's, under date 24th November 1859.
16. The men of native regiments all live in lines, and the sewerage of all of these that I have seen is most defective. The main drains should be lined or cased with brick or stone, and means and appliances provided for flushing them at suitable times, to ensure their being preserved in a cleanly condition. The drainage such as it is usually found to be, and is

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	at this station, may be said to be "Nil." I know of no part of any building used as a barrack or hospital that is damp. The fluid refuse of the barracks flows for a limited distance into the drains, and is then chiefly disposed of by evaporation, for the nature of the subsoil admits of little subsidence into it. There are no cesspits or foul ditches near the station. 17. Six sweepers are daily employed in the lines for the purpose of surface cleansing. The men or their followers generally throw refuse outside their houses early every morning, and this is collected and carried away to about half a mile from the cantonment into the fields by the sweepers. 18. The surface of the cantonment is kept free from excessive and redundant vegetation, and there are no old walls, thick hedges, &c, interfering with the ventilation of the station or bazaar. 19. The bazaar is generally in much the same state as the men's lines, except that it is somewhat more open in itself, and therefore better ventilated. Four sweepers are kept daily employed at the expense of the shopkeepers in the bazaar to keep it clean. Generally speaking it is the custom of the natives of India to keep dungheaps close to their houses. The cowkeepers at this station occupy a part of the bazaar lines, but their part of the station is very open, consequently I do not think much harm can accrue from it, but it should be prevented there as elsewhere. In other respects their houses seem in a cleanly condition. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Sheep and goats are slaughtered in a small open space on the south side of the bazaar. The number slaughtered is from twelve to twenty per diem, and but little offal is left from day to day. All that is fit for human food is bought for that purpose, and such as may not be, the pariah dogs soon dispose of, and the mere garbage or contents of the bowels is thrown into the fields; no nuisance is experienced. The beef butcher, whose business is very limited, is allowed to slaughter on his own premises; on the express condition that he carefully removes without delay all offensive materials. 21, 22. No answer to the queries. 23. Staff serjeants are the only non-commissioned officers here. Their quarters seem to be sufficient for them.
Officers' Quarters.	There are no public officers' quarters at this station.
IV. Health of Troops.	1. The station, district, and surrounding population seem to be for the most part healthy. 2. There appear to be occasional epidemic attacks of cholera, but in no very severe degree. I have no knowledge of the existence of spleen disease as common here. 3. Grain and other articles of food are tolerably cheap, the country is open, the people tolerably well off, and all these circumstances contribute to their general healthiness. 4. The 16th regiment of Madras native infantry arrived at Mangalore from Aden on the 16th April, 1855, and stayed there till 20th December, 1858, or 3¾ years. Its health while there seems to have been good, considering the nature of the station, and the previous effect on their health of the climate of that (Aden) from which they came. The annexed table will show this, while it will also show the ratio of the principal diseases from which they have previously suffered, and do now. The outbreaks of cholera—two the last year—seem to have been inexplicable and unusual in this station. I have not observed that any one portion of the men's present accommodation at this station is more unhealthy than the rest.

Abstract View of the State of Health of the 16th Regiment M.N.I. for the Period and at the Stations herein-below specified.

Stations.	Years of Observation.	Total Admissions.	Total Deaths.	Strength.	Average Daily Sick.	Number Invalided and Pensioned.	Number sent away on Sick Certificate.	Fevers.		Diseases of Lungs.		Rheumatic Affections.		Diseases of Skin.		Venereal Diseases.		Diseases of Stomach and Bowels.		Epidemic Cholera.	
								Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Aden.	1852-3	477	8	794	22	46	1	99	—	36	1	57	—	29	—	23	—	54	1	—	—
	1853-4	474	13	807	28	—	—	144	1	18	3	76	—	25	—	12	—	51	3	—	—
	1854-5	386	4	778	24	—	—	94	1	14	—	83	—	6	—	11	—	68	—	—	—
Mangalore.	1855-6	467	15	737	29	2	0	82	—	12	4	65	—	19	—	55	—	84	2	—	—
	1856-7	502	7	755	31	38	20	136	2	19	2	61	—	42	—	36	—	89	2	—	—
	1857-8	423	9	639	25	19	25	77	3	13	1	62	—	62	—	14	—	92	3	—	—
Hurryhur.	1858-9	594	37	751	26	6	6	203	2	19	2	69	1	49	—	49	—	56	6	37	20
	The regiment arrived at Hurryhur on 7th January 1859, and the Returns immediately above comprise the period from 31st March 1858 to 1st April 1859. Below I append the exposition of the state of health from 31st December 1858 to 1st January 1860.																				
	1859-60	572	45	869	28	25	3	140	1	23	5	33	—	49	—	40	—	54	3	66	32

5. It is not the practice at this station for troops to be camped out.
6. I have never been in charge of troops at hill stations, nor have I had an opportunity of obtaining personal experience on such stations.
7, 8, 9. No personal experience of hill stations.
10. The precautions I would recommend to be observed by troops at hill stations are moderation in the use of vegetables in their diet, and the use of such clothing as is chiefly woollen. Out-of-door duties by day require more shelter or thought for it than where the necessity seems more palpable—in the lower country; but on these matters I have had no opportunity of personal experience.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	11. I have had no experience to enable me to judge of the seasons best adapted for a residence in the hill stations, but I should think that the shortest period which would enable troops to benefit by such residence would be a year or 18 months. 12. No answer to this question. 13. With respect to the precautions to be observed for protecting the health of troops on leaving hill stations for the plains, I am unable, from want of personal experience, to venture other than theoretical opinions, or I must borrow those formed by others, who no doubt will furnish the results of their experience. 14. Looking to the consideration of this question in the largest point of view, and to the possible necessity at any future time for protracted field service in the plains, I should think it unwise to adopt, at any rate extensively, the plan of locating troops in hill stations with short periods of service in the plains. On the contrary, though I have not the results of observation of troops so situated to give in support of my view, yet I should think that locating them in the plains, with short periods of change to the hills, would be at least equally conducive to their health, while it would keep them in a condition generally better able to bear any sudden call for field service in the plains, whether for short periods or otherwise. My long residence in one of the hottest stations in the south of India inclines me to venture this opinion. It is now 17 years since I was connected with an European regiment; but, looking to my experience then gained during a protracted march with the left wing of Her Majesty's 4th (King's Own) regiment (from October 1842 till March 1843), and the good health and spirits enjoyed by the men on that occasion, also to the desirability of lessening the monotony of the same scenery day after day, month after month, I think that frequent change of station on the plains, for European troops, is highly calculated to have a beneficial effect on the health of the European soldier, and no less on that of the European officer. With regard to native troops, however, I have some reason, however, for thinking otherwise, excepting as regards the colder stations, which are *per se* inimical to their health, or the larger stations, where the price of food is often too large for their pay. A march entails so much expense on the sepoy from the necessity of procuring carriage—often at a great outlay—for the followers, that I think the more protracted stay in stations would be beneficial to his health and spirits; but in such cases every facility should be afforded to European officers of obtaining occasional leave of absence from their regiments. 15, 16. No answer to these questions. 17. I know of no higher ground near this station that could be advantageously occupied as a hill station. 18. This question, relative to the particular classes of surface and subsoil best suited for stations, has not engaged so much of my attention hitherto as to justify my answering it in a detailed or positive manner. In a general way I may note that it has occurred to me that those stations were the most unhealthy where primitive or "igneous" rocks approached nearest to the surface, or, where conjoined with this, the soil or subsoil was of a more or less impervious nature from being calcareous, or more or less clayey; while, on the contrary, *cæteris paribus*, those where the underlying rocks were of the aqueous order, such as the various sandstone, argillaceous, or calcareous rocks or stratiform deposits, with any character of soil or subsoil, excepting the more modern alluvial deposits, were comparatively more healthy. 19. Soldiers should not proceed to India prior to 19, nor after 25 or 26, years of age, and should land there from July till October. I have no experience to say how troops are disposed of on first landing in India, as, on the disembarkation of the troops in charge of which I left England in 1847, they were at once removed from my charge. From my own experience I cannot say what precautions should be adopted for preserving the health of recruits on first landing in India. 20. From what I observed in Her Majesty's 4th (King's Own) regiment, 17 years ago, it seems to me that previous service in Australia is a very good preliminary proceeding. So far as my knowledge of the climate of Bangalore enables me to form an opinion, I should think troops being sent there (if kept under supervision by experienced officers, to exercise the necessary control over their movements) preferable to sending them to the Nielgherries —for the Madras presidency. I would make it a general depôt for all British troops on their first arrival. 21. I have no personal knowledge of the mode of transport of troops from the port to the interior usually adopted. 22. As a general rule, I do not think any man should be made to serve more than 10 years continuously at a time in India. 23. I think, as regards the conducting of medical boards, there should be perfect liberty of expression of opinion, though it may differ from that of any or those of all the other members (senior or other), and, so far as my own experience—now rather large—enables me to form an opinion, it has always been so without detriment either to the state or to the individual concerned. In other respects the modes of procedure open to adoption are calculated to induce conflict of opinion, viz., 1st, inasmuch as the regimental medical officer must include in the roll of men whom he considers on medical grounds unfit for service those also whom the commanding officer considers unfit, although the medical officer sees no ground to justify concurrence in such an opinion. Again, the commanding officer has the right of calling for a board of field officers to support his appeal against the opinion of the medical board who may adjudge any given man or number of men fit for service, notwithstanding his previous expression of opinion as to their unfitness. I see no ground to suggest any change, as the present system seems calculated to protect alike individual interests and those of the state. 24. Invalids should leave India for home so as to arrive in the latter end of spring or the beginning of autumn.
Diseases.	1. There are inspections of the young recruits once a week in this regiment, but it is not general in the native army, nor do I think an adequate advantage is gained by it, as it is calculated to diminish what little self-respect some of them may have. 2. No case of scorbutus has occurred at this station. 3. The occurrence of hepatic diseases among native troops may rather be considered as merely accidental than as *per se* incidental to climate; natives do occasionally suffer from them, but the proportion is small in reference to the sum total of diseases. Natives are apt to

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	suffer from engorgement of the liver no less than of the spleen in obstinate intermittents, and the adoption of a line of treatment thus indicated is often necessary for the arrest of intermittents. In the course of 20 years' service I have met with five fatal cases of abscess of the liver among natives. On examination of the records of this regiment, I find that in a total of 4,400 sick during nine years (1850–9) there were 51 admissions from disease of the liver, and that six proved fatal, one of abscess, and one of jaundice, while stationed at Aden, also one of jaundice and another of abscess after the regiment left Aden: whereas in the three following years there were only two fatal cases. The ratio of hepatic to all other cases is, for this regiment, 1·165 per cent.; the ratio of fatal hepatic cases to all admissions ·136 per cent.; and the ratio of deaths from hepatic diseases to admissions from the same is 11·764 per cent. I am inclined to think, on examination of the records of other native regiments, the disease and fatal cases from it would not be found to bear so high a ratio.

4. Dracunculus seems to be specially endemic in certain localities, contracted through the immersion for a greater or less length of time of the bare extremities in water infested by the animals, the ova of which, or one or more of the young, probably enter the softened cuticle, and eventually become fully developed in the cellular tissue. As a rule, it seems to be found in the lower extremity below the knee, and I have seen a few cases above, only one however have I extracted from the scrotum. Occasionally it is found to obtain a residence in the upper extremity, and I have heard of a case in which the extremity of the nose was the seat. The prophylactic measures to be recommended are self-evident; viz., to avoid recourse to such pools or tanks as these animals are known to be found in. Out of the 4,400 admissions in nine years, there were only eight from dracunculus or a per-centage of ·181. No cases of this disease were known at Aden.

5. Out of 4,400 cases under treatment during nine successive years in this regiment there were 275 of venereal affections, being a per-centage of 6·250. I am doubtful whether the establishment of lock hospitals would be advantageous as regards the native army. I think, however, it might be otherwise for the European portion of the army.

6. The following are the diseases from which the troops at this station suffer:—

Fevers.—From the Table transmitted (in reply to Question 4, Division Health of the Troops,) it will be seen in the last line, that the regiment has suffered very little more from fevers in one year here than it did in the years 1856–7, at Mangalore. Natives usually suffer more from fevers in the higher and drier stations, with more variable temperature, and such will probably be the case in this station. The majority of fevers assume the intermittent form, and usually the quotidian type.

Dysentery.—The troops seem to suffer less from dysentery here than at the last station. In the official year 1856–7 (from March to April) there were 28 cases; in 1857–8 there were 31 cases, and in 1858–9, there were 16 cases. During the last twelve months (the residence here of the regiment since the commencement of the year 1859), there have been only 12 admissions. They get in this station better and cheaper grain than they did in the last. In, that they probably consumed much of badly prepared unwholesome dried salt fish, instead of which they can here get as cheaply or nearly so, sheep's or goat's flesh.

Cholera.—There has been no cholera in this regiment since 1854, till it came into this district in 1859. There was an epidemic attack in January, and another in June of that year, which did not entirely leave till September. In the Mysore district generally it commonly prevails, but is said not to be very prevalent here.

Small-Pox.—No epidemic of small-pox has yet been experienced, vaccination is kept up in the regiment as a preventive measure.

Rheumatism.—Rheumatic affections do not seem to exist in unusual amount here.

The following Table shows the proportion which admissions and deaths from these diseases bear to the total admissions and deaths.

Period of Observation.	Diseases.	Proportion of Admissions to Total Admissions.	Proportion of Deaths to Total Deaths.
		per Cent.	per Cent.
12 months, from 1st January 1859 to 31st December 1859.	Fever	24·476	0·450
	Dysentery	3·671	6·666
	Cholera	11·537	71·133
	Small pox	1·223	none.
	Rheumatism	5·769	none.
9 years, from 31st March 1850 to 1st April 1859.	Cholera	1·022	19·444

7. The nosological character of the more frequent zymotic diseases is as follows:—

1. Cholera is usually characterized by excessive prostration of vital power in all its manifestations, by more or less of purging of rice-water evacuations (occasionally with a reddish tinge of greater or less depth) and vomitings; though sometimes neither of these present themselves from first to last; suppression of all the true secretions (especially the biliary and urinary), cold extremities, with shrunken skin and features, a feeble almost obliterated voice, deafness, a complete *insouciance* of what is going on around, intellect seems to remain, cramps occasionally, though often none, and intense almost unquenchable thirst.

2. Small-pox is not often seen in its genuine form, but is mostly modified, the "pseudo-pustule" wanting the true central depression, and seldom leaving anything like a "pit" in its site when desquamation takes place. The premonitory fever is seldom well marked.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	3. Measles.—Is generally well marked as regards the catarrhal symptoms, and sometimes severe pulmonary complication supervenes. The skin affection is by no means well marked, it seems seldom to pass into the true exanthemetous form, a thickly aggregated papular eruption only making its appearance. 4. Fevers.—The principal notable feature is their marked tendency to the intermittent form in natives. Of 964 cases treated in the course of nine years, the ephemeral type constituted 35·67 per cent., while the intermittents were 60·12 per cent. A large proportion of those called ephemeral may probably, in reality, be looked upon as intermittents cut short by treatment. 5. Rheumatism, in many of its forms, presents symptoms affording strong grounds for presumption that it owes much to syphilitic poison lurking in the system, for its causation in a very considerable proportion of the admissions. It is difficult to procure sufficiently precise data in support of this view, from the facilities enjoyed by natives of having recourse to native treatment for primary disease. These diseases have seemed to me to occur at any or all seasons indifferently, and I have not noticed that any uniform or determinate condition of climate or atmosphere has preceded or accompanied their appearance. It has not occurred to me to find that these diseases attach themselves to any given portions, specially or exclusively of station, bazaar, or native dwellings, &c., and in fact, when the sanitary condition of all parts is mainly and essentially the same, it can hardly be expected to be otherwise. In cantonments, where officers live in private bungalows, and where, consequently, the sanitary condition can, and ought to be in a better state, the number of cases are comparatively few. Among natives I am inclined to attribute much more of influence in the causation, and keeping up of epidemic cholera, to the carelessness and filthiness of the grain merchants and purveyors of other articles of food, than to any deficiency in drainage, water supply, ventilation, &c., &c., referred to in this question. I attribute much of evil influence to the low order of true personal cleanliness, both as to clothing and in every other respect, among the native population generally, and the class of persons from whom food is usually obtained in particular. 8. I have not observed any marked influence on the prevalence of epidemic disease through the nature of the soldiers' duties, either in barracks, on the march, or in the field. I have only marched once with native troops; but I have been on the march three times with European troops. One of these marches was a protracted one of five months; but the men were so well looked after, that I think their habits on the march can little, if at all, have disposed them to such attacks. 9. Small doses of quinine as a prophylactic against malarial diseases have not been generally tried at this station; but personally I have so used it, and as I believe with advantage. 10. With reference to cholera; where native troops are concerned, I think the bazaar should be completely under European surveillance and control, that an occasional thorough inspection of their premises should be officially made, to see that the articles sold by them are of unquestionably good quality, and duly kept in a cleanly way; that all food considered unfit for consumption should be confiscated and then and there burned; while the person keeping or exposing it for sale should be severely fined, and the process adopted should be speedy, summary, and without appeal. Any marked defect in the sanitary condition of their premises, if not remedied after due warning, should also be punishable by fine levied on the spot. It would, I believe, be found that cholera often begins in the bazaar, and spreads thence.
V. INTEMPERANCE	1. This question as to the temperance or intemperance of troops at this station, is not so easy to answer definitely for natives as for Europeans, for the former are not nearly so much under surveillance, and might consequently go to bed drunk, sleep off its effects by morning, or should he be then still unfit for duty, his condition might not be readily or unerringly assignable to such a cause. The European living in barracks can hardly go to bed drunk without its being known. He can hardly use "liquor" in his barrack room without its being known, whereas the sepoy in his own hut lives in a state of comparative privacy. There are no means existing to give the proportion of confirmed drunkards at this station. 2. There are no records in existence as regards native troops, to enable me to answer this question, with respect to admissions into hospital from diseases caused directly or indirectly by intemperance. Drunkenness is always punished as an offence, but is not so prominently noticed as a crime in the case of natives as in that of Europeans; in all probability because not so easily recognisable or susceptible of proof. 3. The sale of spirits in the regimental bazaar at this town is prohibited; but they are easily procurable in the neighbourhood. The natives however do not have recourse to alcoholic drinks exclusively. Opium and various preparations of hemp and dhatura are easily procurable in the bazaar. Spirit forms no part of the ration for convalescents, nor are rations in India given to native troops. No drinks other than intoxicating drinks are sold in the bazaar. 4. The daily habitual consumption of spirits I incline to think, has an injurious tendency on the health, and is not at all conducive to the efficiency or the internal discipline of the corps. 5. It would, I think, be beneficial to restrict the use of spirit within reasonable limits. Its issue ought to be abolished as part of the ration; but it might not be proper to prohibit its sale in the canteen or bazaar (where the amount consumed can be known), as this might result in the men going elsewhere and getting a noxious spirit, in an unlimited quantity. 6. I am of opinion that sound wholesome malt liquor is much less likely to be prejudicial, and would, I think, be preferable to such wines as could or should be issued in a tropical country. 7. There is no coffee, tea, nor lemonade, &c. at this station, but I am inclined to think that as a general principle those who use these beverages, instead of spirits or malt liquors, are likely to enjoy better health, and therefore, to be more efficient, while also, more amenable to proper discipline than the habitual (and especially the excessive) consumer of spirits or malt liquor.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	8. I think it would be beneficial to the health of troops to suppress altogether the spirit ration. There might possibly be exceptional cases or occasions in which a medical officer would sanction, were it thought desirable to refer to him, departure from the rule as a temporary measure; but there would still be the ground for fear that a man habituated to spirits for a long time past would then seek it elsewhere, irrespective of quality. 9. I think it would be beneficial to prohibit the sale of spirits, and permit only the sale of beer, coffee, tea, &c.; but with well-marked limitations for special subjects or occasions. 10, 11. No reply to these questions.
VI. Diet.	No information under this head.
VII. Dress, Accoutrements, and	1. The soldier's dress consists of the following articles:—Full dress or review order. Tunic, white trousers, turban, and pulputty, pair of sandals, gulputty (stock), and ungreka (worn under the tunic). Heavy marching order. Coatee, cloth trousers, turban and cover, pair of sandals, gulputty, ungreka, haversack, and knapsack, complete with boat cloak. Drill costume. Coatee, black cotton trousers, roll-call cap, pair of sandals, gulputty, and ungreka. The accoutrements consist of:—Musket, bayonet, ramrod, waist-belt, non-commissioned rank and file, belt-pouch, non-commissioned rank and file, sling musket, frog-buff bayonet, pouch, musket, 48 rounds, pouch percussion-caps, scabbard, bayonet. The weight of the musket and bayonet is 9 lbs., of the accoutrements 5 lbs., and of the pouch with six rounds 3 lbs. 2 oz., with 60 rounds 6 lbs. 8 oz. The pouch alone weighs 2 lbs. 12 oz., and each cartridge 1 oz. The present dress for native troops is, I think, made too tightly fitting to the frame. I would totally discard the red colour for all arms, and have the outer garment hanging loosely over the chest and body from the shoulders. I would, as far as possible, avoid belts to gird the frame; everything save the cartridge-box and bayonet as far as possible should hang on or from the shoulders. Whether by day or night such clothing would on the one hand be cooler, and on the other warmer and more comfortable than tightly-fitting garments. The only difficulty might be in the proper disposition of the fully-equipped cartridge-box on native service; but for this, and every other article save the boat-cloak (to be fastened on as now by loop-straps crossing in front of each shoulder), I think one belt alone necessary, viz., a broad waist-belt, not girding the waist tightly, but rather sitting as it were on the hips. I think the adoption of something like the general style of dress of the "Zouave" would probably be more consonant with the comfort and inclinations of the native force than the assimilation of their dress to that of the European. As regards head dress, I would suggest for Europeans, instead of the wicker helmet lately ordered, one made of "rumdah" (as made up in Dharwar, Bombay) for protection from heat or cold on the hills or plains; a simple waterproof cover might be kept in the crown of it for use, as occasion required. For under clothing I would suggest the general adoption of flannel; for body clothing, the total rejection of scarlet, and adoption of khakee (of cotton drill, or coarse brown holland) for drill purposes and all ordinary duties; adoption of a cloth tunic for full dress, general guards, or field service, its colour to resemble that in use in the Bavarian army, or some tinge of khakee. Socks of woollen to be used at such seasons, as dew or rain fall would expose the feet to damp; or on the line of march loose trousers and leather gaiters; all necessary belts to be of simply browned leather. Natives might wear the khakee if supplied with a simply-made flannel jacket or vest to wear under the thinner one. They would not object, either, to a felt helmet, I am disposed to think; but, as before stated, I am of opinion that a Zouave style of dress would best meet their wishes and requirements. At present they wear on guard the drill dress, and for wet weather they have a boat cloak; their topee, being waterproof, needs no protection. Sentries in exposed places have a sentry box; but under ordinary circumstances no special protection from heat is needed by, or provided for them.
Duties.	1. Looking at this question in a medical point of view, I see no necessity, under ordinary requirements of the service, for the arrival of troops in India with a thorough knowledge of drill, while it appears to me that men are better situated for the process of gradual acclimation, during the time employed in teaching them their drill, than they would be if they landed in a condition that would justify the putting them immediately on the roster for general duties with their older comrades. 2. The following is the routine of the soldier's duties:—In the drill season, from September to March, drill five times a week (for recruits morning and evening), independent of the routine of garrison duties and roll calls. Drill generally lasts about 1½ hours, and the men do not appear to suffer in health from it. The best times for drills and parades are about the hours of sunrise and sunset. The best time to commence a march seems to be about one or two hours before sunrise, according to the length of march. Orders on the subject of "marches" are published in "General Regulations," at pp. 330, *et seq.* The men at this station have from five to six nights in bed during the week. 3. Guards are all mounted within one, or at the most, two furlongs of the barracks; guards last 24 hours. Sentries are relieved every two hours. There is a roll call at 7.30 a.m., daily, for "arms' cleaning," and in the evening one at 5.30, or 6 p.m., according to the season. No prejudicial effect seems to result from the routine of night guards; and the usual precautions suffice.
VIII. Instruction and Recreation.	No information under this head.
IX. Military Prisons.	1. The cells for solitary confinement at this station (as I believe is also the case throughout the division), are, in one respect, defectively constructed. They consist of a square mass of substantial masonry, terrace-roofed, with ventilation through four large openings, near the roof on the four walls, and a small central shaft. They are entered by a smaller and somewhat similar structure of the same depth, nearly half its breadth and two-thirds its height, also terraced-roofed. This latter room is usually provided with some receptacle, open for fœcal or urinary deposits, but the odour from such evacuations naturally pervades the larger sleeping apartment, as from its probably heavier nature it is not likely to be readily displaced by air entering from above. Some contrivance should be added to this outer apartment to permit these evacuations being at once deposited on the outside of the cell, and thus, by a closing trap door, obviate the annoyance, at least of their odour pervading the whole interior.

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References to Subjects and Queries.	REPLIES.
X. FIELD SERVICE.	1. No reply to this query. 2. The powers of medical officers seem to be, as regards the conduct of the line of march, &c., comparatively inoperative under ordinary circumstances; as generally interference by them would probably be held to be justifiable only when they see any likelihood of ill results ensuing on the carrying out of orders regimentally issued on these topics. Usually a line of march is arranged, and a "route" forwarded by an officer of the quartermaster-general's department, (without reference as I believe to the medical department), the camping grounds are also specially designated by that department. Practically no deviation is usual from an order so received, but commanding officers are vested with discretionary powers to alter these as circumstances may seem to require, and possibly would not do so without the knowledge and concurrence of the medical officer. Usually commanding officers listen to suggestions of medical officers on the propriety or necessity of avoiding given halting places. Such, however, has not always been done. Consequently, an order was issued some five or six years ago, by his Excellency the Commander-in-Chief, directing attention to the necessity of attending to such suggestions. The place assigned to the medical officer on the line of march is the rear of the column, consequently he has no opportunity of ascertaining the nature of the encamping ground before arrival of the column, and therefore, the camp would not perhaps be changed for light reasons, or such as seemed to be so to others. In European regiments, when practicable, a medical officer goes in advance of the column with the sick, and assists the quarter-master in selecting the ground. It might be advisable to allow the medical officer of the native infantry corps, to go forward when the column has moved on, to enable him to get in sufficiently early before its arrival, to see and form an opinion of the nature of the ground proposed to be taken up. All the ordinary contingencies of a march might be well enough attended to by a medical subordinate. 3. The practical operation of camp regulations, &c., is supposed to be especially under the conduct of regimental quartermasters, who are considered responsible for the sanitary arrangements, &c., on the line of march as they are in cantonment. The powers of the medical officer in these matters are merely nominal, consisting in representations of what in his judgment requires attention, and remonstrances proving of no avail reference to higher authority. 4. Nearly all arrangements for field hospitals, ambulances, &c., are made by the quartermaster general's department, by which office a code of regulations is issued for general guidance. The necessary indents on that department are made out, and forwarded by the quartermaster of the regiment, with the exception of such extra carriage as is provided for by the medical regulations, from which an extract is appended. EXTRACT FROM CODE OF MEDICAL REGULATIONS, MADRAS. "The carriage of all hospital stores, including medicines and instruments, will be provided for by the commissariat, at the expense of Government, upon indents countersigned by the superintending surgeon or in his absence by the officer commanding. Duplicates of these indents shall be forwarded by the superintending surgeon to the medical board; and the responsibility will rest upon the indenting officer, until his requisition has received the sanction of that authority. The duplicate indent, when sanctioned shall be returned to the the superintending surgeon for the purpose of being delivered to the commissariat officer, and will be the proper voucher for the supply. Ft. In. } Whenever it becomes necessary to indent for boxes for the carriage Length - 3 9 } of medicines on carts, boxes of dimensions of a six dozen chest as Breadth - 1 6 } noted in the margin, with padlocks and hinges shall invariably be Depth - 1 6 } indented for as being more easily procurable. "All regiments, European and native, will be provided at the public expense with field medicine chests for the conveyance of the European medicines, &c., when marching or on active service; and detachments either of European or native troops marching from station to station will be supplied with portable medicine boxes Nos. 1 and 2. "Indents for carts or coolies for the carriage of medicines, &c., submitted to the medical board for sanction must be prepared agreeable to the following form, and superintending surgeons are prohibited from forwarding indents which are not in strict accordance with the form here laid down. To Captain Assistant Commissary General. SIR, Please to order the following supply for the carriage of medicines, &c., for the use of the Regiment N.I., proceeding from to effective strength.

Description of Carriage wanted.	Number or Quantity.	Required for the Conveyance of	Sanctioned by Superintending Surgeon.	REMARKS.

Station A.B. Surgeon.
Date C.D. Superintending Surgeon.

N.B.—Any further explanations that may be deemed necessary should be entered in the column of remarks, or at the foot of the indent.

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	"Detachments either of European or native troops, moving from station to station will be supplied with medicines for the march, from the depôts of medical stores at the presidency and out-stations, packed in portable medicine boxes, agreeable to a scale fixed by the medical board, and furnished to the medical and deputy medical storekeepers. "Coolies shall be provided for the carriage of medicines, with all parties of European or native troops, moving from station to station, less than complete corps, but which are sufficiently large to be under the charge of a medical officer in the following proportions, viz., with all detachments consisting of— Europeans: 25 to 75, 75 to 250, 250 to 350 — Natives: 50 to 150, 150 to 400 — Coolies: 1, 2, 3 The above coolies to be supplied in the same manner and under the same forms as prescribed for the carriage of the portable medicine chests attached to corps in the regulations for the quarter-master general's department. "In detachments, either European or native, less than the above, where the assistance of a medical attendant may be necessary, one cooly for the carriage of medicines shall be supplied. "When detachments march from the presidency or other stations where public depôts of medicines are maintained, the medical storekeeper at the former, and the deputy medical storekeepers at the latter, are to be charged with the duty of indenting for the carriage authorized by the paragraphs 28, 29, and 30. At other places the duty is to be performed by the surgeon or assistant surgeon proceeding in charge of the detachment, or, in cases where medical attendants of inferior rank only are ordered, by the garrison or other surgeon who may have been in previous charge of the troops about to march. "Indents for coolies for detachments of regiments should bear upon them the particular duty of each cooly employed, and the nature and weight of carriage conveyed by him. "On the arrival of detachments at their respective destinations, the boxes with the remains of the supply of medicines will be delivered over to the medical or deputy medical storekeeper, as the case may be, or, at stations where there is no depôt of medical stores, to the senior medical officer present. These medicines to be brought on the hospital books of the medical officers, by whom they are received and accounted for under the head 'Received by Transfer from Detachments." A true extract. James Peterkin, M.D., Surgeon of the 16th regiment of Madras N.I.
XI. Statistics of Sickness and Mortality.	No information under this head is given.
XII. Hospitals.	1. A plan of the hospital at this station is transmitted. 2. The hospital is situated in the rear (west) of the sepoys' lines, with an open space of about 100 feet intervening. The bazaar is to the rear (west) of the hospital, stretching away from it on either flank; but there is an open square in the immediate rear of the hospital, used as a market place for supplies brought in from the surrounding country once a week. The site of the hospital is sufficiently open and ventilated, and, although buildings have been erected somewhat too closely on either flank, there are open spaces in front and rear of it, the former 966 feet long and 127 feet broad, and the latter 238 feet long and 236 feet broad. The site is generally healthy, being on the highest part of the space in which it is situated. The surface water from rain-fall runs off on all sides, though there is no special drainage for that purpose. There are no nuisances from marshes, foul ground, water pits, &c., experienced at this station. 3. The water supply is abundant and wholesome, and for drinking purposes is procured by puckallies from the river. There are close at hand, one on either flank to its front, in the space between it and the lines, two fine "bowries," well supplied with water for cleansing purposes, but, being saline, it is not fit for drinking. 4. Refuse water and other fluid impurities are allowed to flow into the cesspit attached to the hospital privy. Solid impurities are swept up and removed daily to some distance from the lines. The cesspit is in the immediate rear of the hospital enclosure, and has no external outlet. 5. The several wards are all on the ground-floor, which is raised a foot and a half from the level of the area in front, and two feet above that in rear of the hospital. There are no underground openings or ventiducts. No provision for the conveying away of roof water is necessary, as the ground slopes away on all sides, and the water runs off without sinking into the subsoil. There is no surface drainage or guttering round the hospital. The walls and pillars of the hospital are built of brick and chunam, the roof of teak wood tiled, the floor of stone flags, and the compound wall brick and clay, plastered with chunam. The walls and roof are single, with verandahs sufficient to keep out excessive heat. There is a verandah all round the hospital, eight feet and a quarter deep, which at the four corners is enclosed to form a surgery, store room, bath room, and dissecting room; the last two occasionally used for contagious cases or others when the number of sick is large. The verandah affords sufficient shelter from the sun's rays to the central ward. The two small corner rooms adverted to are the only parts of the verandah used for sick, &c. The building is all on the ground-floor.

HERRYHUR. MADRAS.

References to Subjects and Queries. | REPLIES.

Table of Hospital Accommodation.
Total number of wards—1 large and 2 smaller ones in time of need available.
Total regulation number of beds - - - - - 40

Number of Hospital Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet. In.	Feet.	Feet. In.	Feet.					Feet. In.	Feet. In.
Centre ward -	36	131 3	18	12 0 side-walls, 17 5 ridge.	44,755	1243	65½	1½	16 doors	7 0	4 0
Surgery - -	—	19 6	8	9 9	1568	—	—	—	1 door 3 windows	7 0 4 4	3 0 3 5
Stores - - -	—	—	—	—	—	—	—	—	—	—	—
Bath room - -	2	—	—	9 9 outer wall, 11 6 inner.	1568	784	80	1½	—	—	—
Dissecting room	2	—	—	—	—	—	—	—	—	—	—
Cook room - -	—	12 0	8	8 8	—	—	—	—	1 door	—	—
Necessary - -	—	—	—	—	—	—	—	—	—	—	—

XII. Hospitals—*cont.*

The principal winds are easterly or westerly, and sweep across the hospital, necessitating occasionally the closing of all the doors on one side when blowing strongly. This is inconvenient, as there are no windows to the central ward. There are only glass windows to the surgery and store room. These, while conducive in some degree to ventilation, contribute in no wise to the cooling, as they are too low to let out upper currents of heated air.

6. The numerous doors, with the openings in the ridge of the roof, are sufficient for the ventilation of the wards. The upper halves of the doors are constructed after the fashion of Venetian blinds, of a succession of horizontal flaps, preventing the passage of air or light when allowed to fall vertically over each other, but admitting their passage from below horizontally, or from above downwards, according to the degree in which they are made to revolve horizontally on their axes. The windows of the bath and dissecting rooms are constructed in a similar way.

7, 8. There are no artificial means for cooling or warming the air admitted into the wards. There are no prescribed periods for limewashing the walls and ceilings of the hospital; but it is done as often as the medical officer may deem expedient either for cleanliness of aspect or with reference to any recent epidemic disease.

9. The privy is an oblong partially double roofed, pent tiled building of brick and chunam 12 feet by 8 feet, and 9 feet high, with openings at the upper part of each gable end. The central part of the roof is elevated about a foot above the general level of the ends, to admit of more complete top ventilation. At the back part of the floor (which inclines well from before backwards, and is flagged with stone) is a long wooden bench perforated with openings, beneath each of which is placed an earthen vessel for the reception of stools. Urine is passed at once into the channel at one end, communicating with the cesspit. The use of a cesspit where it is avoidable is objectionable, but the situation of the hospital renders one necessary. The solid matter is carried away daily, and the free washing of the privy floor into the cesspit seems to prevent its being very offensive.

10. With natives there are no special lavatory arrangements. As much water as the sick require is furnished to them, and occasionally convalescents are allowed to go to their houses for a short time to bathe. Bathing with natives is usually synonymous with presumed restoration to health, and the process of washing which of their own accord usually satisfies them while in hospital, is of the most superficial and unsatisfactory nature to the views of an European.

11. Natives object to bathing except in their own way, consequently it is seldom resorted to except as a remedial measure. For that purpose there is a wooden bathing tub, and a bath of brick and chunam which are sufficient. Hip and foot baths of wood are also available.

12. The washing of the linen is done by the hospital dhobie at the river, half a mile distant. The means are sufficient for the demand.

13. The storage is sufficient, and dry.

14. The bedsteads are wooden frames painted white, and laced with broad tapes to support the bedding, which consists of a blue indigo dyed mattress, filled with straw, when necessary a quilted cotton counterpane, and a pillow stuffed with straw and a pillow case. In such cases as require it woollen "cumblies" are available as extra warm coverings.

15. Natives prepare their own diets, or have it prepared by a relative. The kitchen of a native hospital is consequently almost exclusively used for the preparation of poultices, &c.

16. Copies of diet tables are forwarded.

17. The hospital attendants are, a standing hospital havildar to maintain discipline, &c., and also a daily orderly private. All those sick who require it have orderlies to attend on them as long as such aid is indispensable. The system operates very well, and seems to be sufficient for the purpose.

18. The general sanitary condition of the hospital is good. A peculiar form of ulcer, though not in its intrinsic nature at all serious, prevailed some months ago. I strove in vain to arrive at the probable cause of it, thinking probably it might be due to some carelessness in dressing wounds, but notwithstanding all my endeavours to elucidate the true cause, I could not satisfy myself on that point. It has long since ceased to exist, or has become inoperative.

19. It would I think be a great improvement in every way to the hospital if the first, third, and fifth doors in front and rear were dispensed with, and in their stead glazed windows placed as high up in the walls as possible. In this way by filling up the lower parts of the doorways space would be given for six more beds, while light and ventilation might at all times be increased.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	20. Convalescents are sent out with a non-commissioned officer, if such be in hospital, or in charge of the oldest or steadiest private. The time and place for their walking exercise being prescribed, they only go out morning and evening when shaded walks and seats are not required. 21. It is supposed to be the special duty of native dressers, under the general superintendence and knowledge of the medical officer, to attend to the native "Followers." Occasionally severe or dangerous cases are visited by the medical officer, or admitted into hospital. Such cases are usually kept in the room called the dissecting room (seldom used for such a purpose), and their own relatives are allowed to attend on them. There is also a large supplementary temporary building which was erected some months ago for the reception of cases of cholera. These arrangements are sufficient. 22. No reply to this query. 23. With regard to repairs of building, &c., in the hospital, the medical officer has in general only to make known to the officer commanding the regiment what is necessary, and it receives early, if not immediate attention. For hospital comforts he requires the sanction of the superintending surgeon, and then procures them through the commissariat, excepting such as are provided periodically on monthly indents. The scale of hospital comforts ought to be increased for native sick; the medical officer often having to supply bread, meat, soup, and milk, which are not allowed by the present regulations, at his own expense, or that of officers willing to aid him in doing so. 24. No wards or hospitals for convalescents exist, nor do they appear necessary.
XIII. Burial of the Dead.	1. The burial ground used for British troops is at the north-east corner of the cantonment, and between 200 and 300 yards from the nearest officers' quarters. It is, consequently, during the prevalence of the north-east monsoon to the windward of the cantonment; at most other times it is to the leeward. The station being seldom occupied by British troops, the principal persons buried there are European officers of native regiments, or an occasional native Protestant Christian. The ground has never been consecrated. 2. Its area is between 30 and 40 yards square. Its soil is gravel, aggregated by a stiff clayey matrix, and beneath it probably decomposing syenite. The ground is enclosed by a good wall, and carefully kept, but there is no drainage. I should think that decomposition takes place but slowly from the dry nature of the soil. 3. There are no regulations as to grave space. The ground is about half filled. Graves are generally four or five feet deep, and are never reopened. In tropical countries decomposition takes place so rapidly that interment takes place, if possible, not later than 12 hours after death. 4. The grave-yard is never offensive. 5. Mussulmans have a burial ground on the bank of the river, half a mile to the west of the south flank of the cantonment. Hindoos are either burnt or buried in the bed of the river, in the rear of the north flank of the lines, but lower down the river. There is a small Roman Catholic burial ground, about a furlong from the regimental lines, on its south flank or in the south-west corner of the cantonment. 6, 7. No injury accrues to the public health from the present practice, nor are any improvements in the manner of disposal after death to be suggested.

(Signed) James Peterkin, M.D., Surgeon, 16th Regiment M.N.I.
G. Carr, Lieutenant-Col. Commanding Station of Hurryhur.

March 9, 1860.

MANGALORE.

Accommodation—Native Troops. { Artillery - - One-third Company. / Infantry - - 8th and 51st Regiment M.N.I.

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is undulating, wooded, hilly, and dry, with wet cultivation in the valleys; there are cocoa-nut plantations and two rivers within three miles. 2. The elevation of the station above the sea is about 40 feet, and about from 70 to 100 feet below the mean elevation of the adjacent country. There is higher and healthier ground near the station, a portion of which has been allotted for the lines of a second regiment. The country generally, though higher than the cantonment, is of an undulating and broken character, much intersected by streams and cultivated valleys. 3. The nearest mountain or table land is about 50 miles to the Mysore country in a direct line, and 80 miles by the nearest road. The Mysore table land is about 2,500 feet above the sea. 4. The nearest water is the sea at Mangalore harbour distant about a quarter of a mile from the station; there are also two rivers, one on the north, the other on the south, within 3 miles. The vicinity is not liable to overflow. There is no broken ground, ravines, or water pits near. 5. The station is tolerably open to the sea, but shut in on the land by cocoa-nut plantations and higher ground. The temperature of the station is not raised by the buildings being exposed to reflected sun heat. The station is exposed to land and sea breezes. 6. All the valleys are richly cultivated. There are no works of irrigation. The cultivation of rice is not prohibited. Indigo is not cultivated, nor is the preparation of hemp or flax carried on near the station. 7. The town of Mangalore is within a quarter of a mile.

MANGALORE.
MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	8. The heights are of varied geological structure capped with laterite, with narrow valleys of rich alluvium. The present cantonment stands upon ground probably occupied by native population in former times. 9. Water is usually found at a depth of 20 or 25 feet below the surface during the dry season, and 10 or 12 feet during the rainy season. 10. The rainfall or water from surface springs flows readily away. There is no adjacent higher ground, the drainage from which must necessarily pass into the subsoil of the station. 11. The water supply is derived from wells, and is not stored in open tanks. There are no tanks. 12. The water is good and abundant, but its chemical composition has not been ascertained, and is raised by hand. 13. There are no other topographical points bearing on the health of the station not included in the foregoing replies. 14. New stations are selected by the Commander-in-Chief and his Quartermaster-General's Department in communication with the medical authorities and the Engineer's Department.
II. CLIMATE.	1. There are no means or instruments available at the military station for conducting and registering meteorological observations. 3. I have no observations to offer with regard to the character of the climate, or as to its influence upon the health of the troops. 4. The site chosen for a new cantonment is more conducive to health than that of the present one. 5. The stations at which I have served are Palamcottah, Quilon, Trichinopoly, Paulyhurst, Cannanore, Secunderabad, Sholapore, Kulladghee, Madras, Penang, Vellore, Mangalore. To the best of my recollection the latter station is the most trying to native troops. The climate is debilitating.
III. SANITARY CONDITION OF STATION.	3. There are no European troops or barracks at this station. 17. Hitherto surface cleansing has been performed solely by the heavy rains falling from May to September, but authority has now been granted to the officer commanding the station to entertain scavengers' carts, and sweepers. 18. The surface of the cantonment is kept free from vegetation, and there are no old walls, thick hedges, &c., interfering with the ventilation of the station, bazaar, &c. 19. Save 5 or 6 stalls, the bazaars are in the adjacent native town. Within the military cantonment the ground is patrolled, to prevent nuisances. No camp followers are resident therein (save the relations of sepoys living in regimental lines), except the small proportion of the officers' servants, who sleep in their master's compounds. There are no public latrines, but directions to apply for sanction to erect such have just been given by Government. The condition of the native houses generally is good and clean. 20. No nuisance is experienced from the condition of the slaughtering places. 21. There are no horses in the station. 22. There are no artillery or cavalry stables, or picketing grounds. 23. No reply to this query.
Officers' Quarters.	1. The condition of the officers' quarters is generally good and well drained. I have no improvements to suggest with regard to them.
IV. HEALTH OF THE TROOPS.	1. The station, generally speaking, is healthy, and the adjoining native population is generally healthy. 2. The most frequent disease is fever, frequently attended with enlargement of the spleen. 3. I know of no particular circumstance to which the healthiness or unhealthiness of the neighbouring native population is to be attributed. 4. The last station at which the detachment of artillery were located was St. Thomas's Mount, but the time they were resident there is not known. Left it and arrived at Mangalore in 1858. The last station of 8th Regiment Native Infantry was Tongoo, where they remained for three years, which place they left, arriving in Mangalore in November and December 1858. The state of health and chief diseases of Tongoo were,—stomach and bowel diseases, fevers, ulcers, and rheumatism, with dropsy. The chief diseases at Mangalore were—mild fevers, rheumatism, diarrhœa, ulcers, and catarrhal complaints. The last station of 51st Regiment Native Infantry was Palamcotta, where they remained a year and half; left it and arrived at Mangalore in December 1858, the state of health and chief diseases being, health generally good, suffering from fever, dysentery, and diarrhœa. The chief diseases at Mangalore being fever, dysentery, and diarrhœa. 5. The troops at the station are not camped out. 6. I have not been in charge of troops at hill stations. 7. I have had no means of observing the liability of troops residing at hill stations to febrile and other diseases on returning to the plains. 8. I approve of good elevated sites for stations for troops. 9. I am not aware of any diseases to which troops are liable to be attacked on going to hill stations. 10. A flannel cummerbund should invariably be worn on proceeding from the plains to hill stations. 11. The best seasons adapted for residence at hill stations are immediately before and after the commencement of the monsoon; and the shortest period of residence to benefit the health of troops should be not less than from 1 year to 18 months. 12. No experience of hill stations. 13. Care should be taken not to allow troops leaving hill stations for the plains to be exposed to the night air; diet should also be particularly attended to. 14. European troops should, as far as the service admits, be located on hill stations. When required for service in the plains they would, in my opinion, be better able to undergo fatigue and exposure. I consider an occasional change of station on the plains most beneficial to all. 15. As well as I remember the barracks at Jackatalla are sufficient for the health and comfort of the troops. 16. No experience at hill stations.

References to Subjects and Queries.	Replies.
IV. Health of Troops—*cont.*	17. There is no higher ground near the station which could be advantageously occupied as a hill station, except Mercara in Cavoy. 18. Cannot say what is the most suitable soil for stations. 19. The best age for soldiers proceeding to India would be from 18 to 20 years, and the best period for landing is in what is usually termed the cold season. 20. I think it would be a good plan to send young soldiers as soon as possible after landing to some hill district. I cannot, however, speak from experience. 21. The mode of transport of troops is by marching them early in the morning from one encamping ground to another. I know of no other precautions than are at present adopted for preserving the health and comfort of the troops on the route. Railways are making progress, and will no doubt effect a great saving of health and life. On some lines of road the European troops are moved in bullock carriages. Troops of all classes should on the march reach their ground half an hour after sunrise. 22. If a British soldier is temperate in his habits, he can well serve 20 years in India. There are of course exceptional cases. 23. No suggestions to make regarding medical boards. 24. Invalids should leave India so as to arrive in England at the commencement of Midsummer.
Diseases.	1. There are no regular inspection parades for the discovery of incipient diseases at this station. 2. There is not nor has there been scorbutic disease among the troops at the present station. 3. Hepatic disease is very uncommon among native troops. 4. Dracunculus is rare here. 5. The proportion of the constantly sick from venereal diseases to the total sick in the hospital is one per cent. I could not suggest any additional precautions with natives. It is not worth while establishing lock hospitals for native troops. 6. Troops at the station suffer not unfrequently from:— *Fevers* of a quotidian type. *Dysentery.*—Rare. *Cholera.*—Uncertain. *Small-pox.*—Troops here are generally free from small-pox, even when that disease is prevalent around. *Rheumatism.*—Native troops are very liable to rheumatism; especially during the land winds. The proportions which admissions and deaths from these diseases bear to the total admissions and deaths, are as follow; viz.:—

Average for year ending 31st January 1860.

	Admissions.	Deaths.
Fevers	27½ per 100	1 in 4
Dysentery	5 „	None
Cholera	None	None
Small-pox	None	None
Rheumatism	17¾ per 100	None

	7. No experience in the nosological character of the more frequent zymotic diseases. There is no bazaar or native huts in the station, but many close to it. 8. The prevalence of epidemic disease is influenced by the crowding, and insufficient diet of the families on the march, which predisposes to epidemic diseases, such as cholera, &c. 9. Quinine has not been tried as a prophylactic against malarial diseases. 10. More cleanliness would tend to prevent or mitigate epidemic disease at the station.
V. Intemperance.	1. There are no European soldiers at the station. The sepoys are generally sober, and there are no confirmed drunkards. 2. Drunkenness is very rare among native troops; it is punished when it occurs as an offence. 3. Distilled spirits are sold in the bazaar. The quality and quantity consumed is not known there being no Europeans. There are no other drinks sold at the canteen or bazaar other than intoxicating drinks, which are injurious to health. 4. It is not conducive to the efficiency and internal discipline of the corps. 5. We think it would be highly beneficial to the health of the troops to restrict or abolish the sale of spirits in the canteens or bazaars. 6. Malt liquors or wines are generally not requisite to maintain good health; the use of spirits is under all circumstances positively injurious to health. 7. Coffee, tea, lemonade, soda water, and similar drinks have a beneficial effect on the health, and are more favorable (when used in moderation and proper quantities) to efficiency and discipline than malt liquors and wine, and decidedly more so than spirits. 8. We think it would be beneficial to the health of European troops to suppress altogether the spirit ration whether for soldiers or convalescents, and to substitute for it beer, tea, or coffee, &c. 9. We think it would be beneficial to prohibit the sale of spirituous liquors in the canteens. 10. I have no recommendations to make on these points, other than in the foregoing replies. 11. There are no canteen or bazaar regulations on these subjects.
IX. Military Prisons.	1. The cells for native troops at this station are bad, low, very confined, and ill ventilated.
X. Field Service.	1. There are no regulations for field medical service not included in the General Presidency Regulations. 2. The practical working powers of the medical officers depend in a great measure upon the commanding officers. 3. I cannot suggest any change in the practical operation of the regulations for preservation of the health of the troops as to the selection of camping grounds and general sanitary regulations. 4. Regulations adopted in the Presidency for field hospitals, ambulances, transport of sick, and of hospital supplies, can be supplied by the Quartermaster-General's Department.
XI. Statistics of Sickness and Mortality.	No information under this head is afforded.

MANGALORE.
MADRAS.

Reference to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	2. There are no European barracks or stables for troop horses in the station. A large number of public cattle are kept at one spot within the station, fully 400 yards from the hospital and not in the direction of any prevailing wind. The hospital is within 80 yards of a bazaar, where fish and vegetables are sold. The site of the hospital is freely ventilated; in the rear, and close to the hospital, are low native huts and tall trees. The remaining three sides are open and freely ventilated. It is is quite free from all nuisances depending on water or marsh. 3. The water supply is abundant and wholesome. 4. Refuse water and other impurities are removed by means of a sink and closed drain, the latter having its outlet much below the level of the hospital at about 120 yards off. 5. Both wards are on a level of four feet from the ground, and there is no ventilation under the floors, which are of masonry. Roof water runs off of itself. Percolation hardly takes place at all on a laterite ridge such as the hospital stands on. The surface drainage is left to nature and is sufficient to carry off the heaviest rainfall with rapidity. The hospital is built of laterite stone, in mortar. The roofs and walls are single, but thick enough to keep the interior cool. A verandah runs along the whole range of walls inside and outside the building. It is 10 feet broad and amply sufficient, and the sick and convalescent have free access thereto. The hospital consists of one flat only. Total number of wards, 2. Total number of beds, 56.

Number of Wards or Hospital Huts.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height of Opening.	Width of Opening.
		Feet.	Feet.	Feet.	Feet.	Feet.	Square feet.	Feet.		Feet.	Feet.
Measurements, &c., same for both wards.	Space for 28 cots.	72	30	14	30,840	1,101½	77	2	8	5	5
									Doors.		
									3	7	4

The hospital receives the full benefit of prevailing winds. The windows open outwards and their arrangement and construction are conducive to ventilation and coolness.

6. The wards are ventilated by the windows and doors, which is sufficient. Jhilmils are constructed in the body of the shutter from top to bottom.
7. There are no means in use for cooling the air admitted into the ward.
8. No means for warming necessary. The walls and ceilings of the wards are cleansed and lime-washed once a year, but oftener if required by the medical officer.
9. There is one privy to each ward in the corners inside the hospital yard. They open into a covered drain. Lime is thrown down, and the drain is flushed with water every morning. They are not offensive since openings have been pierced in the walls and a dormer ventilator placed in the roof of each.
10. There are no lavatories.
11. The means of bathing for the sick is a large wooden tub,—one to each ward—which is sufficient and convenient.
12. The washing and drying of the hospital is done by means of the dhoby.
13. There is no storage for linen.
14. All hospital cots should be iron and of light configuration. There are a few such in hospital, but the greater number are of the old wooden muster, and there is no bedding.
15. There is a convenient cook room forming the rear of the hospital range, used only for medical preparations, as there are no European troops in garrison.
16. The diet tables, diet rolls and all other returns, required for working the internal economy of the hospital, are the same as those laid down for the army in general.
17. The attendance on the sick is supplied by a hospital havildar in each ward, detailed from the effective strength of the garrison,—orderlies are detailed on requisition from the medical officer—and is sufficient
18. The sanitary condition of the hospital is good; no epidemic disease, gangrene or pyæmia, has ever made its appearance.
19. I can suggest no improvements.
20. Convalescents are allowed to go to their houses, parading once a day at hospital.
21. Native regiments do not come under the provision for treatment of soldiers' sick wives and children, and no improvement is necessary in the present arrangements.
22. There are no regulations enforced at the station which are not included in the General Presidency Medical Regulations.
23. The medical officer may recommend anything he thinks fit, both as regards diet and medical comforts.
24. There are no convalescent wards or hospital at the station.

XIII. BURIAL OF THE DEAD.

1. The burial ground used by British troops is close to the station on the land-wind side.
2. The area is 5,000 square yards.
   Soil and sub-soil: hard laterite.
   Drainage: perfect.
   The rate of decomposition is unknown and the ground is carefully kept.
3. The grave space allowed is eight feet from end to end, and the graves range side by side as near as practicable. The depth is four and a half to five feet, and the graves are never re-opened.
   There is no regulation as to period of interment after death, but it generally takes place the same afternoon or the succeeding morning.
   The same remark applies to native troops.
4. The European grave yard is never offensive, it is enclosed by a wall.
5. The dead of the camp-followers or bazaar people are disposed of by burial.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	6. The native graves are shallow, and the grave yards—Roman Catholic, Hindoo, and Mussulman—in contact with the native town; some are in the heart of it, which, no doubt, affects health. 7. I would suggest that native burial grounds should be removed further from the population.

(Signed) Th. T. Pears, Colonel, Madras Engineers, District Engineer of South Canara.
J. M. Madden, Lieutenant-Colonel, Commanding Mangalore.
B. S. Chimmo, Surgeon, Madras Army, Senior Medical Officer in Garrison.

29th February 1860.

COCHIN.

Accommodation:—Native Troops - Infantry - { 160 Rank and File, with Commissioned and Non-commissioned Officers in proportion.

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is low and sandy, and covered with cocoa-nut topes. It is flat and surrounded with water. 2. The elevation of the station above the sea is about 4 feet. There is no higher or healthier ground, in British territory, adjoining the station. 3. The nearest high ground is about 30 miles distant from the station. The hills rise to a height of 6,000 feet above the level of the sea. 4. The station is surrounded with water, the sea being on one side and the backwater on the other. The vicinity is not liable to overflow of water. Near the station is the old fort ditch, which is in a swampy state and ought to be filled up. 5. The station is open, but inside the fort the old rampart rather impedes the ventilation. The temperature of the station is decidedly raised by the exposure of the buildings to reflected sun heat. The station is exposed to cold and variable winds from the land side during the dry season, beginning in November about 7 p.m. and gradually becoming later until in February its commencement is about 2 a.m. During the continuance of these winds rheumatism, elephantiasis, and fever are very prevalent. The sea breeze is also unhealthy, which is probably due to the elements of malaria having been carried out to sea and returned with the sea breeze. 6. The surrounding country is cultivated, being covered with plantations of cocoa-nut trees. There are no works of irrigation near the station. There is no cultivation of rice, although no prohibition exists, nor of indigo, neither is the preparation of hemp or flax carried on near the station. 7. There is a native town about 2 miles across the water at Ernacotum. 8. The surface and soil of the district is sandy. The ground on which the station stands was formerly occupied by the Dutch or Portuguese, but to what extent their native town extended beyond the fortification I am unable to state. 9. During the dry season water is found from 4 to 6 feet below the surface, and from 3 to 5 feet during the rainy season. 10. The rain-fall and water sinks into the pervious sandy soil. 11. The water supply of the station is derived in part from wells, which from the unclean state of the privies have become unfit for use. That for drinking purposes is brought daily from Alwaye, 18 miles off. There is one tank, which is used by the sepoys; it is generally well supplied with water. The plants and animals contained in the tank are those which usually exist in tanks filled during the monsoon and left to themselves in the dry weather. The water in the tank is used for drinking purposes and also for bathing. With regard to the pollution of the water in the tank, it depends upon the season of the year. During the monsoon the water is good, but in the dry season it often becomes impure from stagnation and vegetation. No nuisance or malaria apparently proceeds from the tank. 12. Water may be had at the station in any quantity but its quality is not good. It is brackish and injurious to health. Those who do not get water from Alwaye obtain it from the sepoy tank or from the wells. 13. No reply. 14. Cannot say by whom or after what amount of examination new stations are selected. No new station should be permanently occupied until after one year's trial at least by competent persons.
II. Climate.	1. The meteorological instruments at the station are one thermometer and an aneroid barometer which is unserviceable. There is also a pluviometer. 2. No meteorological table transmitted. 3. The climate is variable; the breeze from the land, owing to its coming over a large expanse of water, is moist and chilly. It is occasionally very sultry. The climate appears to occasion rheumatic affections amongst those troops exposed to the night air.

COCHIN.
MADRAS.

References to Subjects and Queries.	REPLIES.

II. Climate—*cont.*

The following comparative table of deaths amongst the civil population for each month is based on an average of the years 1855–56–57 and part of 1859–60, and will show the most healthy and the most unhealthy months at the station. The population is about 11,326.

Deaths, Average.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
Non-epidemics - -	25¾	26¾	28⅔	24⅔	30⅓	26½	35	36⅔	32¼	30	23¾	27½
Epidemics - - -	14¼	11¾	15½	6	5⅓	2⅔	3⅔	2	26	11	7¾	11
All causes - - -	40	38½	54	30⅔	35⅔	29	38⅔	38⅔	58¼	41	31½	38½

The epidemics in 1855–56–57 were small-pox; in 1859–60, cholera. The prevailing diseases in the unhealthy months are those of the bowels.

4. If Cochin were kept moderately clean it is very improbable a more healthy place could be found near the station.

5. The stations at which I have served are Rangoon and Burmah, Bangalore, the Mount, Poonamalee, Jackatalla, Bellary, Bolarum, and Aurungabad. The two last are by far the most healthy. Rangoon and Burmah are very moist, which conjoined with great heat affected the liver and bowels. At Bangalore, native troops predisposed to fever suffer severely. The Mount and Poonamalee are pretty healthy. Jackatalla is a good station for men who do not drink.

III. SANITARY CONDITION OF STATION.

1, 2, 3. No map or plan of the station is transmitted. A ground plan of the barracks is sent.

4 to 8. No replies to these queries.

9. The barracks are constructed of laterite in chuman, with tiled roofs. The huts are constructed of bamboo mats with cudjan roofs. The base is filled with hard material and coated with chunam 1½ inches thick; the floors are raised about 2 feet above the level of the ground. No air passes underneath.

11. The barracks and cantonment are kept in repair by the Fiscal of Cochin. All public buildings are limewashed once a year.

12, 13. No reply as to lavatories, &c., and barrack cook-houses. The sepoys wash their clothes in the sepoy tank, and dry them at its sides.

14, 15, 16. No replies to these queries.

There is a very foul ditch caused by the engineer's department having removed the old rampart, to obtain the stones for the purpose of mending the roads. A ditch has been thus made, which is employed as a public privy.

17. Within what is called the fort, the road and parade is kept pretty clean; but the old rampart, the sides of the road, and every odd corner, are in the most disgusting condition; cleansing is hardly attempted. The refuse should be removed to the sea beach.

18. The surface of the cantonment is only kept free of vegetation by the cattle, which are allowed to roam all over it, and sometimes the convicts cut down the larger weeds. The remains of the old rampart on the land side, which is the receptacle of all kinds of filth, impedes the sea breeze from coming to the sepoy lines, and should be levelled.

19. The sanitary condition of the bazaar is as bad as it could possibly be; cleanliness is unknown, and there is no drainage. The streets are used as privies without hindrance. No regulation for preserving cleanliness is attempted. The suggestions of the civil surgeon to the joint magistrates meet with no attention whatever. Either the opinion of the medical officer should be taken, or reasons for the contrary course placed on record. The native houses are in a filthy condition, especially those of the Moptahs; their compounds are used as receptacles for filth. A small village of native Protestants was most injudiciously permitted to be erected between the sea and the sepoy lines. It is a most unhealthy row of houses, and in a bad situation. It would be a great benefit if they were removed and erected elsewhere, further from Cochin.

20. Animals are slaughtered in the bazaar. No regulations are in force on the subject. The offal used to be thrown down in a moist ditch, close to the Civil Government Dispensary. All animals should be slaughtered on the sea beach, and the offal buried there.

21, 22, 23. No replies to these queries.

Officers' Quarters.

1. No reply under this head.

IV. HEALTH OF TROOPS.

1. The station, district, and native population are generally healthy.

2. The disease most prevalent among the native population is elephantiasis Arabum, or Cochin leg, which fatal disease generally terminates by dropsy. Spleen disease is unknown.

3. Unhealthiness amongst the native population is attributable to their filthy habits and deficient sanitary police.

4. The troops at this station were previously stationed at Madras, where they had been for some months. No portion of the men's accommodation at Cochin is more unhealthy than the rest.

5. Troops are never camped out.

6. With regard to hill stations, I have done duty at Jackatalla with H. M.'s 74th. They suffered from dysentery, which appeared to me to be due to drinking freely, and being crowded in barracks.

7. No experience as to whether long residence on hill stations renders troops more or less liable to febrile and other diseases on returning to the plains.

8. I decidedly approve of hill stations for the generality of European troops, but there are many exceptions.

9. The diseases to which troops are liable on going to hill stations are diarrhœa, and less frequently dysentery and hepatitis, whilst rheumatism, phthisis, and secondary syphilis appear to be severe there.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	10. No reply. 11. The best season for residence on hill stations is the cold dry months, and the shortest period of residence to enable troops to receive the benefit of it, is from 10 to 12 months. 12. If Europeans from cold climates suffer less from disease in India than soldiers who have been long in the tropics, I should not be inclined to believe that a prolonged residence on the hills would be detrimental to subsequent service on the plains. 14. My own experience, from having served with troops in the hills, is, that European troops from cold climates do not stand fatigue like seasoned Europeans, and consequently, service on the plains, with short periods of change to hill stations, would be most conducive to the health of troops, should they have to go on service in the plains. Frequent change of service on the plains causes great dissatisfaction from the expense it entails, and thus depresses the spirits and tells upon the health. 15. No reply to this query. 16. No experience of the elevation above the sea most suitable for hill stations. 17. There is no higher ground in British territory, which could be advantageously occupied as a hill station nearer than the Neilgherries. 18. The most unhealthy soil for stations is the black cotton soil. 19. The best age for soldiers proceeding to India is from 22 to 28 years. They should land in India after the hot season has subsided. They should be sent at once to their regiments or to hill depôts. 20. Troops should be sent direct from the home depôts to India. I have done duty with two of Her Majesty's regiments from the Cape, and they appeared as liable to disease as men direct from Europe. On landing, troops should be sent to hill depôts, if such were established. 21. Troops are transported from the port to the interior by rail for a short distance, but generally by marching stage by stage. 22. The number of years a British soldier should serve in India is about 10. 23. In the conduct of the business of the medical boards I have never known a conflict of opinion as regarded invaliding. In pensioning sepoys the present plan is most unsatisfactory; they commence, if not promoted, skulking into hospital after about 15 years' service, and so on, till they get pensioned. A better plan would be to send all into the invalid battalions unless they have served 40 years or lost a limb, and never pension a man direct from his corps or division. All pensioners should be yearly examined in the first two years to see if they get well. 24. No experience as to the best time of year for the departure of invalids leaving India for home.
Diseases.	1. A regular inspection parade takes place when itch is very prevalent, every Tuesday at 5 p.m. 2. There has been no scorbutus among the troops. 3. Hepatic disease is very rare; no admissions for it among the troops for several years. 4. Dracunculus does not exist in this part of India. Sepoys affected with it have come to Cochin from infected localities; but in them it invariably disappears after 12 months' residence. 5. Venereal diseases have occurred to the extent of about 1·7 per cent. of the total sick. Lock hospitals properly managed would be a great boon and save many from being permanently disqualified for the service. 6. During the year ending 1st April 1859, 20 cases of fever are registered by my predecessor as having occurred; viz. ephemeral, 7; quotidian, 8; common continued, 5. These last I have never personally seen amongst natives in Cochin. *Dysentery.*—Two cases in the year. *Cholera.*—Two cases have occurred since 1st April 1859. *Small-pox.*—None. *Rheumatism.*—Nine cases. The proportion of admissions from these diseases to the total admissions and deaths are—

Diseases.	Admissions.	Deaths.	Per cent. of Admissions to Total.
Fevers	20	0	17·0
Dysentery	2	0	1·7
Cholera	0	0	0·0
Small-pox	0	0	0·0
Rheumatism	9	0	7·7

7. The most frequent zymotic diseases are small-pox and cholera. The former is most prevalent during the cold dry months of January, February, and March, and the latter from August to January. The climatic and atmospheric conditions which precede and accompany these diseases are various. The most low and dirty parts are the most affected by these diseases, where crowded dwellings with filth of all sorts around them abound, and no sanitary precautions worth mentioning are attempted. The troops are cleanly, but the dirty habits of the civil population, their addiction to spirits and fermented liquor, opium eating, and consumption of semi-putrid fish, only makes it wonderful that the mortality is not ten-fold what it is.
8. The prevalence of epidemic disease is not at all influenced by the nature of the soldiers' duties, &c.
9. No experience of small doses of quinine as a prophylactic in malarious diseases, never having seen it tried on large bodies of men, but have given small doses of camphor and quinine as a prophylactic in those diseases with satisfactory results.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	10. Cleanliness would prevent or mitigate epidemic disease at this station. The natives are allowed to attend to the calls of nature wherever they may happen to be. Large holes exist by the side of the roads, and rubbish is thrown down everywhere, causing the atmosphere at times to be excessively foul. The East Indians and old Dutch inhabitants should not be permitted to have closed privies as at present, and the drains should be taken care of and kept clean.
V. INTEMPERANCE.	1. The soldiers at the station are temperate. 2. Unable to state the proportion of admissions into hospital from diseases caused by intemperance. Drunkenness is always punished as an offence. 3. There are no canteens iu Cochin. Distilled spirits are sold in the bazaars. 4. Spirits are necessary to recovery in some instances, when taken in moderation; but as generally drank by the troops, are the cause of much sickness. Their abolition would be a gain in every way. 5. It would be beneficial to restrict or abolish the spirit ration, provided the soldier could not obtain an inferior spirit in the bazaar; as it is, doing so would probably send him to the native dealers, where he would buy a most deleterious description of spirit. 6. Malt liquors are much more conducive to health than wines, and wines more so than spirits. 7 to 11. No replies to these queries.
X. FIELD SERVICE.	1, 2. With regard to the practical working of the powers of medical officers in reference to the conduct of the line of march, &c., if the commandant pleases, he can adopt and carry out the recommendations of the medical officer. Some commandants send the senior medical officer forward with the quartermaster, to choose the ground. Other commandants detach a few men the night before. 3. The medical officer should, in conjunction with the quartermaster, select the site of camping grounds; the hospital should be to the leeward of the camp, and the tents faced N. and S., to prevent the morning and evening sun from shining in under the kanats of the men's tents. Twenty-five men is too many for the present tents. The tentage for the hospital department is insufficient. The medical officer's powers are laid down in the regulations. The power of the commandant is supreme. 4. The ward coolies are quite insufficient in number for field hospitals, if cholera breaks out; besides which they are apt to abscond. There is a distinct staff attached to the field hospital, under a senior surgeon. The sick are transported in doolies or sick carts.
XI. SICKNESS AND MORTALITY.	No reply under this head.
XII. HOSPITALS.	1. Ground plan of hospital transmitted. 3. The water supply is abundant and wholesome. 4. There are no means of drainage employed to remove the refuse water and impurities. 5. The height of the lowest wards above the ground is 1½ feet. No air passes underneath the floor. The roof water sinks into the subsoil. The verandahs are never used for the accommodation of the sick, convalescents, or others. The hospital is placed so as to receive the benefit of the prevailing winds. 6, 7. No replies to these queries. 8. There are no means of warming the wards. Since my arrival in Cochin 14 months since, I have been unable to get the hospital whitewashed; twice or three times the division has been applied to. It should be done twice a year at least. The wards are cleansed and whitewashed as often as it is necessary. 9. There is no drainage to the privies, nor water supply. One small opening exists through the wall, and urine passing through sinks into the ground outside; the place is frequently very offensive. 10. No reply. 11. Two tubs are used for bathing the sick, and, if properly repaired, would be sufficient. 12. The hospital linen is taken away by the cornicopoly, who gets it cleaned. The present means for that purpose are sufficient. 13. The storage is sufficient, and dry. 14. There are five cots in the hospital. 15. Reference to plan. 16. No reply. 17. The provision for attendance on the sick is as follows:—one hospital orderly and a sweeper. If a sepoy is unable to cook his own food, or requires the attendance of a person to himself, one of his comrades is told off for that purpose. The present plan appears to work well. 18. The position of the hospital is unobjectionable, and no epidemic diseases have broken out in it. 19. The repairs of the hospital are as yet untouched; the building, if left as it is, will probably before long be a ruin. Even whitewashing is not regularly done. The privies are merely one small room, with no place in which the excrements can go to be cleared away, whilst the urine merely flows outside, and sinks into the soil. 20. Convalescents can take exercise outside the hospital, in the parade ground under the trees. 21. The families of sepoys may come into the hospital; if too ill to do so, the medical subordinate goes to the lines to see them, and according to his report, the medical officer goes or not to their hut. No complaints have been made of the present arrangements, and they appear to be satisfactory. 22. The only hospital regulations enforced are those in the medical code in use. 23. The medical officer's powers in matters pertaining to the hospital are confined to complaints to the commandant of the station, for transmission to the division. He cannot repair the building. He can alter the diet, should any European patients be in hospital. He can also order sago, arrowroot, wine, or other medical comforts for sepoys, and they are supplied by the cornicopoly. 24. There are no convalescent wards, nor are they requisite.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1. The burial ground in general use is about a mile from the town, and well situated with regard to the prevailing wind. The old burial ground (now closed, except in the case of one or two registered vaults) is within the fort, and the prevailing sea breeze passes over it before reaching most of the houses. 2. Its area is 144 by 136 feet. The subsoil is sea sand; the rain rapidly sinks in. I presume decomposition is rapid. The ground is properly enclosed with neat stone walls, and gate, with lock and key. 3. The grave space allowed is 6 or 7 feet by 2 feet, in the case of common graves; greater width where stone monuments are erected. The ordinary interval is about 2 feet The depth is 5 or 6 feet, the loose nature of the soil, and the certainty of coming to water in abundance at most seasons of the year, rendering it difficult to go to a greater depth. The graves are not usually re-opened, the Protestant population being small. Interment usually takes place 24 hours after death. 4. I am not aware of the new ground ever being offensive to any one. 5. With reference to the dead of camp followers and bazaar people, if they have friends, they bury them in their own burial places; if not, they are carried by the police to an island, about 1¼ miles from Cochin, and interred there. 6. No injury to the public health accrues from the present practice.

March 20, 1860. (Signed) W. Barwise, Captain, Commanding Cochin.
Francis Day, Civil Surgeon.

CUDDAPAH.

Accommodation—Native Troops, Infantry, One complete regiment of Native Infantry.

References to Subjects and Queries.	Replies.
I. Topography.	1. The station is entirely surrounded by a chain of mountains which rise abruptly from the plains, the sides of which are for the most part covered with jungle; are dry and smoothly excavated. There is not much wood in the vicinity of Cuddapah, there being only a few large mango, peepul, and tamarind trees. During the dry weather the supply of water is deficient. 2. The station is elevated about 507 feet above the level of the sea, but it is about on the same level with the adjacent country. Yerramullah, an elevated platform forming part of a range called the Palcondah hills, is a higher and healthier situation than that of the station. These hills are about 17 miles distant east from Cuddapah, and 1,800 feet above the town of that name. 3. The mountains to the north-east and south are from three to six miles off, and from 1,000 to 1,500 feet above the level of the station. 4. Two nullahs, having their source in the south-west range of hills, are the nearest water. One of these runs immediately in front of the cantonment; the other, called the river Boga, is larger, and sweeps along the west of the town. The chief river is the Pemaur, which receives two rivers within the district. It is distant from Cuddapah nine miles. Tanks abound in the district. The Ralla river sometimes overflows its banks during the south-west monsoon. Ravines and water-pits exist in the neighbourhood of the station with an injurious effect on health. 5. The station is open and freely exposed to winds, and not at all subjected to high temperature by reflected sun heat. It is, however, exposed to the land winds, the effect of which is injurious. 6. The plains environing the station are cultivated and irrigated by the numerous tanks in the vicinity of the cantonments. Artificial irrigation is observed to affect the health of the station when indigo is grown. The cultivation of rice is not prohibited, and it is grown close up to the station. One crop of rice is averaged within the year to two of indigo, the latter yielding the highest profit. The indigo grown near the station has a most injurious effect on health, generating malaria, which is attributed to the nature of the manure employed, viz., green boughs of trees, &c. 7. The large town of Cuddapah is close to the station. 8. The soil of the plains to the north and west of the cantonment is of rich black cotton loam, but in the vicinity of the hills and valley of Cuddapah it is overlaid with alluvial deposit, the débris of the neighbouring rocks being light sandy, and in some places intermixed with an adhesive reddish earth. The eastern and western range of mountains consist chiefly of gneiss overlaid with sandstone and sienite, the beds being intersected with veins of greenstone. The principal rock in the southern ranges is granite with gneiss and mica slate more or less in a state of decomposition. In other parts the formation is sandstone; it usually rests on limestone, and is non-fossiliferous. 9. Water is usually found during the dry season at a depth of 30 feet, and during the rainy season at five feet below the surface. 10. The rain-fall and surface water sink into the pervious subsoil, what remains on the surface very soon evaporating. The drainage from the adjacent higher ground passes into the subsoil of the station. 11. The water supply of the station is derived from the river, wells, and from a few tanks or pits which receive the rain-water. They are dry for the most part, except during the rainy season, and when they become low they are used by the natives for the deposit of every description of filth, the water being liable to every kind of pollution. There are plenty of tanks in the native town, surrounded by prickly pear, which, when decomposing, is a great source of malaria. The best means of prevention would be by not allowing the natives to use such tanks for depositing their excrement in, and cutting down or removing the prickly pear to a distance. 12. The water supply throughout the district is deficient, and is strongly impregnated with the saline matters of the soil. These become concentrated by evaporation in the hot weather, so that river water is generally used by the major part of the native population.

CUDDAPAH. MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	13. The hills on the north, east, and south being within three to six miles of the station have a most injurious effect by greatly increasing the heat of the station. 14. All new stations should be tested by quartering a few companies of a native regiment for some months previously on the spot. Its range of temperature should be ascertained, as well as its topography, and the supply and nature of the water as well as the prevailing diseases of the locality.
II. CLIMATE.	1. The instruments available at the station for meteorological observations are a thermometer, dry and wet bulb, and a barometer. 2. TABLE of Meteorological Observations from 1st January 1859 to 31st December 1859.

Months.	Barometer, Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds.		Days of Sunshine.	Remarks as to Cloud, Dew, Wind, Storms, &c.
										Direction.	Force.		
Jan. -	29·658		7	78	74	77	72	98	—	East.	Calm.	31	
Feb. -	29·858		13¾	82	74	80½	71	95	—	Do.	Do.	28	
March	29·761		12	89	79	86	75	98	—	Do.	Do.	31	
April	29·656		10	90	86	89	79	100	2·6	Do.	Moderate.	28	2 days cloudy—rained.
May -	29·661		11	93	86	93	82	108	1·20	Do.	Do.	29	2 days cloudy—rained.
June -	29·648		10	91	86	90	81	99	4·40	S.West.	High winds.	26	4 days cloudy—rained.
July -	29·592		9	87	83	87	78	101	9·45	Do.	Do.	11	20 days cloudy—rained
Aug. -	29·556		7	86	82	85	78	95	6·50	Do.	Do.	11	20 days cloudy—rained
Sept. -	29·558		7	87	83	85	79	97	2·75	N.East.	Moderate.	20	10 days cloudy—rained
Oct. -	29·557		8	85	83	84	77	95	3·20	Do.	Do.	19	12 days cloudy—rained
Nov. -	29·710		5	77	73	77	74	90	9·80	Do.	High winds.	8	22 days cloudy—rained
Dec. -	29·761		8	77	73	76	72	85	—	N.	Calm.	29	2 days cloudy—no rain.

3. The climate is intensely hot during the day, with great closeness and stagnation of air at night. The mean temperature in the shade during the year is 81½°, the maximum being 98° and the minimum 65°, average daily range within doors from 15° to 20°. The difference of annual extremes is 33°. It has its cool, hot and dry, and hot and humid seasons. Malarious diseases are most frequent from the commencement of the rainy season till the drying up of the ground, in consequence of the extreme heat, so that from February till the end of May malarious diseases are not frequent. This place is quite unfit to be occupied by troops, being, in fact, the worst station in India. There are plenty of places on the surrounding hills which would be more suitable for a station. The most unhealthy months are those in which the ground is moist and capable of affording constant evaporation from the surface under intense heat. This lasts from the end of June till the end of January, which period includes the monsoon weather, the filling and drying up of nullahs, rivers, &c., when the vegetable and animal deposits in them are exposed to the rays of the sun, and prove a source of miasma. From February till the end of May the soil is dry and burnt up; the source of malaria is then dried up, and intermittent fevers are less frequent.
4. Maddenpully, about 70 miles distant, possesses a climate more conducive to health than that of the station.
5. No reply to this query.

III. SANITARY CONDITION OF THE STATION.

1 to 17. No reply to these queries.
18. There are some old walls, &c. existing which interfere with the health of the town, and such is the case in every native town, unoccupied houses being used as places for the deposit of filth.
19. In the bazaar improvements are being made, such as the removal of old walls, the prickly pear, &c., but it is still in a bad condition. The native houses in the town are in a wretched condition, dung-heaps and cesspits being found within them.
20 to end. No further information under this head.

IV. HEALTH OF THE TROOPS.

1. The station and adjoining districts are very unhealthy.
2. The natives suffer a good deal from intermittent fevers, and a few have diseased spleens.
3. The unhealthiness of the neighbouring native population is attributed to the low situation of the town of Cuddapah, and to the large quantity of wet cultivation in and around it.
4. The troops here were formerly stationed at Arcot, where they had been for nearly six months, and marched from thence for Cuddapah on the 23rd June 1858. The health of the men while at Arcot was good, and they arrived at Cuddapah in a healthy condition. They have, however, suffered a good deal from intermittent fever since. No instance has appeared of any portion of the men's present accommodation proving more unhealthy than the rest.
5. The troops are never camped out at this station.
6, 7, 8. I have had no personal experience of hill stations, but the benefit of selecting such for troops cannot be doubted.
9, 10. Men on first going to hill stations are subject to fevers and dysentery. After a residence in the plains they should avoid exposure in the first instance, and wear clothing suitable to the temperature.
11 to 14. It would be most beneficial to the health of troops to locate them on hill stations, with short periods of service on the plains. Frequent change of stations on the plains would not be beneficial to the health and spirits of the soldiers or to convalescents.
15, 16. No experience to reply to these queries in reference to hill stations.
17. There is some higher ground in the vicinity of the station which could be advantageously occupied.
18. I cannot speak from experience as to the class of soil or subsoil which would prove more healthy or unhealthy for stations.
9. Soldiers proceeding to India should be from 18 to 23 years of age, and should land there during the cold season. I have no experience to show how troops are disposed of on first landing, but in order to preserve their health they should be sent to a cool station.
20. Whether troops are sent direct to India from the home depôts or to an intermediate station for a time is a matter of no importance, provided they are sent to a cool station on arrival and exposure avoided. They should be sent to the hill districts and gradually accustomed to the climates.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	21. I cannot say what is the usual mode adopted for transporting troops from the port to the interior. 22. The number of years a British soldier should serve in India is from 20 to 25, as a general rule, so as to be effective for active service. 23. No reply to this query. 24. Invalids should leave India so as to arrive in England at the commencement of the summer, and thus avoid the extreme change of temperature from India to the winter of England.
Diseases.	1. No inspection parades for the discovery of incipient diseases are necessary at this station. 2. No case of scorbutic disease has occurred at this station. The disease is attributable to bad living and the absence of fresh vegetables. 3. In a native corps there are very few cases of hepatic disease. 4. There have been very few cases of dracunculus at this hospital, but it is very common in the gaol and native town. 5. Very few cases of venereal disease occur in a native corps. 6. Table of Admissions into the Hospital, 3rd Extra Regiment N.I., from the 7th July 1858 till the 7th March 1860.

Diseases.		Admissions.	Deaths.
Fevers	Feb. Ephemera - - -	29	—
	,, Quotidian Intermittent - -	1,342	5
	,, Tertian Intermittent - -	274	—
Dysentery - - - -		21	1
Cholera - - - - -		15	3
Small-pox - - - - -		10	—
Rheumatism - - - - -		61	—

	7. The nosological character of the more frequent zymotic diseases is, class pyrexiæ; order febris. They are most prevalent in the wet and cold seasons after the heavy rains, when the vegetable matter in the beds of rivers, tanks, indigo factories, and the manure employed for the growth of indigo is not too wet to undergo decomposition. Fever is endemic in the native town. The native dwellings are much crowded together. The causes which predispose the natives to these diseases are bad food, want of cleanliness, and crowding together in small huts. 8. No reply to this query. 9. Small doses of quinine have not been tried at this station as a prophylactic against malarial diseases. 10. The only remark I have to make is that the place is not suited for a military station.
V. Intemperance.	1, 2. The necessary information to form a statistical table showing the effect of total abstinence, temperance, and drunkenness, on the amount of sickness, mortality, and crime at the station, is not obtainable. 3. It is a habit among Europeans to take a dram before morning parade. The effect is most pernicious, not only as being productive of drunkenness, but also as tending to produce hepatic disease, dysentery, &c., especially as regards recruits. Spirit is given under the direction of the medical officer to convalescents; it is good in quality. The amount given is variable in quantity. 4. The consumption of spirits in the morning is most injurious. When judiciously given to convalescents it is beneficial, as it is also for troops marching through a country where the water is bad; but malt liquor is far preferable. 5. The use of spirituous liquors as part of the ration for European troops should be abolished, and malt liquor supplied instead. 6. Malt liquor and wines in moderation are beneficial, but spirits are most injurious. 7. The use of tea, coffee, lemonade, &c. is excellent in their influence on health, efficiency, and discipline. Spirits should not be issued to the men. 8. As regards Europeans, it would be most beneficial to suppress altogether the spirit ration; beer, however, is necessary. In reference to convalescents, no absolute rule can apply to them. To those recovering from dysentery and diarrhœa, for instance, malt liquors would often be injurious, whereas a judicious allowance of spirits would be beneficial then. 9, 10. It would be advantageous to abolish the sale of spirituous liquors in the canteens, and to permit only beer, coffee, tea, lemonade, &c. to be sold there within certain limits; a limited supply would be beneficial. 11. No reply to this query.
X. Field Service.	1, 2. Medical officers have very little influence as regards the conduct of the line of march of troops, camping, bivouacking, &c. In the campaign of 1857–58, flat paddy-fields, with rising ground on either side, I always found were chosen as the site of our encampment ground, so that the first shower of rain covered the surface of the ground with water; in many instances it was more than six inches deep during the monsoon. 3. Except in the monsoon, ordinary ground may be chosen where the supply of water is abundant and good. During the monsoon the site of the encampment ground should not be surrounded by rising ground. 4. No reply to this query.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1, 2. The position of the hospital is to the west of the town, which is distant about a mile, and south of the cantonment, bazaar, and native houses. The site is open and well ventilated, but Cuddapah is full of malaria. The hospital is not very far from the river. 3. The water supply is abundant and wholesome. 4. All impurities are removed from the hospital by toties. 5. The wards are not raised above the level of the ground. There is no provision made for carrying off the roof-water, but there is a trench round the hospital at a distance from it, and foul water runs off by this, as also does the rain-water. The hospital is built with brick,

CUDDAPAH. MADRAS.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	and has a tiled roof. It is well ventilated, but hot. There are verandahs all round the building, and these are occasionally used for the accommodation of the sick when the wards are full. There is no upper story to the hospital.

TABLE of Hospital Accommodation.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
No. 2	Large 40	Ft. in. 32 0	Ft. in. 19 4	Ft. in. 14 10	576	16	Breadth. Ft. in. 2 7 Length. Ft. in. 6 5	Ft. in. 1 6	10	Ft. in. 6 6	Ft. in. 3 10½
	Small 12	17 7	Do.	Do.	504	4	Do.	Do.	2	Do.	Do.

6, 7. No reply to these queries.
8. No means for producing artificial warmth are required in Cuddapah. In the north-west provinces and in Oude stoves are used for this purpose.
9 to 15. No replies to these queries.
16. The native sick provide their own rations, any article of food considered injurious by the medical officer being prohibited, and extras ordered at his direction.
17. The sick natives are attended by any comrade they may select, besides which there is one hospital serjeant and two orderlies to a hospital.
18. The sanitary condition of the hospital is good, and no instance of gangrene or pyæmia have appeared in it. Fever prevails epidemically at the station during the wet and cold seasons.
19. No reply to this query.
20. No arrangements are made for the exercise of convalescents among the native sick.
21. In European regiments the soldiers' sick wives and children are generally attended in hospital by the medical officer in charge. In native regiments, as a general rule, they are attended by the apothecary, or, if there be no apothecary, by the hospital dresser. The medical officer attends in dangerous cases.
22. No reply to this query.
23. The medical officer, as a general rule, has every power in matters appertaining to the sanitary state of the hospital, repairs of buildings, change of diet, &c., as far as the exigencies of the service will admit.
24. There are no convalescent wards for native sick, such not being absolutely necessary for them.

XIII. BURIAL OF THE DEAD. — No information under this head.

(Signed) J. G. MACDOWELL, Lieut.
T. G. HOWELL, Assistant Surgeon.
G. HEMERY, Captain, Madras Engineers.

31st July 1861.

PALAMCOTTAH.

Accommodation.—Native Troops Infantry { Havildars 51, Naiques 50, and Privates 700

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The cantonment of Palamcottah, comprising a portion of the Old Fort, is situate about two miles to the S.E. of the river Tambrapoorney. It lies in latitude 8° 42′ north, and longitude 77° 47′ east. The country to the S. and E. of the station is composed of light red soil, is well drained, and cultivated mostly in dry grain. To the N. and W. is an extensive sheet of rice cultivation irrigated by a channel running parallel to the river. The cultivation is carried to the margin of the river bank. Two crops are yearly raised, and the country may be said to be under water for nine or perhaps ten months of the year. To the S. and E. low hills, composed chiefly of pure quartz rock, rise up from the plain, which is in parts sandy. The soil may be described as a sandy loam overlaying a species of mouldering gneiss rock. Close to the banks of the Tambrapoorney there are several thick topes. The sandy plain W.S. and E. is dotted with clumps of the palmyra, for the growth of which the soil is well adapted. Good water is procurable from the canal, running to the N. of the Fort, and when the canal is dry, water of tolerably good quality is to be had in the numerous wells which have been sunk in all directions. 2. The station is about 120 feet above the level of the sea, and may be said to be situated on an extensive plain; it is above the adjacent country. The portion of the cantonment outside the Fort is situated on rather higher ground than that of the Fort itself. No better position appears available. 3. The nearest mountains are between 20 and 25 miles distant from the station, but there is very little table land to be found on them. The peaks of the hills rise to a considerable

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	height, one called the Agusteer peak, supposed at one time to be inaccessible, has been found by the barometer to be 6,200 feet above sea level. The Travancore Rajah has established an observatory on the extreme summit of this hill, where a series of valuable observations have been taken for several years past. 4. The nearest water is that of the canal, running parallel to the river. The station is about 30 miles W. of the sea coast. The vicinity is not liable to overflow except on the occasion of extraordinary freshes, and then only to the north of the river. The ground around the station, although slightly broken up in parts, resulting from the sinking of pits for gravel, is not sufficiently so to cause the lodgment of any quantity of water. 5. The interior of the Fort is not badly ventilated, but a great improvement would doubtless take place in the health of the inhabitants, were the Fort walls, which are high, levelled. The cantonment outside the Fort is particularly well ventilated. The temperature of the interior of the Fort is usually hotter than that of the cantonment outside. This results partly from the ventilation not being so free, and from the houses being more crowded. The station being situated so near to the apex of the peninsula is exposed to winds which are, except during the very hottest months, moderately cool. The S.W. wind which sets in towards the close of May, passes over an extensive sheet of cultivation, and is thus rendered pleasantly cool, although disagreeable at times on account of its violence. The winds from N.E. round to S.W. may be called sea breezes. 6. The country to the north of the station is rich in rice cultivation; sugar, betel, and other grains requiring water being also raised. The ground to the E. and S. is sown with gram and other dry grains. The principal work of irrigation is a canal derived from the Tambrapoorney river; it is about 20 miles long and irrigates a large extent of land. It runs in a semi-circular direction round the W., N.E., and E. sides of the station, the nearest point to the cantonment being about half a mile distant. Several small tanks exist also in different directions. The irrigation being kept up chiefly by minor channels taken from the main canal, the water in which is continually fresh, no ill effects to the health of the station appear to result from artificial irrigation. After the second crop has been reaped (generally towards the middle of March) the fields dry up so very quickly that malaria appears to have no time to generate. No prohibition whatever is made regarding the proximity of rice cultivation, every available piece of ground is brought under irrigation, and although the houses of a large portion of the European community are, as it were, surrounded by rice fields, no ill effects have been noticed. No indigo plantations exist near the station. Flax is occasionally grown by means of artificial irrigation, in small patches bordering the river, and at some distance from the cantonment. 7. The nearest town to Palamcottah is Tinnevelly, one of the largest and most important of the native towns in the district to which it gives its name. 8. The fort of Palamcottah is built on a barely covered rock, generally described as mouldering gneiss although in parts the out-cropping rock is hard and compact. The soil of which the plain is composed (a light red sandy loam) would appear to have been formed by the partial disintegration of the neighbouring hills, which are now chiefly composed of hard imperishable quartz. 9. Well-water is found in the dryest seasons at a depth of from 15 to 20 feet; but during the rainy season the water rises to within 2 or 3 feet of the surface. 10. The country is generally well drained; the rainfall is either caught in tanks, or flows into and is carried off by the irrigating canal to the north of the station. There is no higher ground the drainage from which passes into the subsoil of the station. 11. The water supply is derived chiefly from wells, but the water from the irrigating canal is extensively used, and is preferred by the natives on account of its being generally purer than well water, much of the latter being slightly brackish, and impregnated with lime and magnesia. Water is procured also from small tanks scattered about in various directions. The rain-fed tanks near the station generally hold water for a space of from four to five months. They are free from weeds, and abound with small fish, which are eagerly sought after by the natives. The natives generally wash their clothes and bodies first in the tanks, and then secure chatties of the same water for drinking and other purposes. The water in the tanks being generally drawn off for the irrigation of rice, &c., is not liable to stagnate, and hence the generation of malaria appears to be prevented. No malaria proceeds from any tank. 12. The best drinking water is procurable from wells bordering the irrigating canal, the water of which, itself derived from perennial mountain streams, percolates through the soil to the well cavity, and is sweet and wholesome. That procurable from wells sunk through the gneiss rock, and at some distance from the canal, is generally more or less brackish, owing to the subsoil containing carbonate of lime, magnesia, and other salts. The water from the canal and tanks is simply taken in chatties; that from wells is drawn by means of picottahs. 13. There appear to be no other topographical points worthy of notice. 14. No reply to this query.
II. Climate.	1. The instruments available for conducting and registering meteorological observations are an aneroid barometer, a thermometer, and a pluviometer. 2. Table of meteorological observations from 1st January 1855 to 31st December 1859 inclusive.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Winds, Dews, Storms, &c.
January -	29°·569	82°	8°·86	86°·2	76°	—	—	104°·2	4°·075	N.E.	Moderate.		
February -	29·560	84·5	8·4	90·4	76·6	—	—	104·	1·180	Do.	Do.		
March -	29·686	87·4	9·12	92·6	81·6	—	—	106·8	5·165	N.E. & S.E.	Do.	—	Wind S.E., principally in the afternoon.
April -	29·416	88·8	12·76	94·2	84·2	—	—	107·4	20·145	S.E.	Very moderate.	—	The wind, though principally from S.E., very variable.
May	29·354	84·96	9·74	94·	84·4	—	—	108·2	9·240	N.W.	Moderate.	—	At times the wind is high towards the end of the month.

PALAMCOTTAH. MADRAS.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Mimimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Winds, Dews, Storms, &c.
June -	29°·344	89°·62	8°·58	93°·2	83°·8	—	—	106°·	1°·11	W. & N.W.	High.		
July -	29·330	89·5	7·12	91·8	83·	—	—	83·	·01	N.W.	Do.		
August	29·354	88·61	6·26	93·	82·4	—	—	84·8	·070	Do.	Moderate.	—	Wind sometimes high, depending probably on the fall of rain in the mountains.
September	29·374	80·2	8·16	93·4	82·6	—	—	106·2	2·21	Do.	Do.		
October -	29·383	86·53	10·08	90·6	81·6	—	—	104·2	14·305	Do.	Do.	—	Wind is variable during this month.
November	29·421	83·8	8·46	86·8	79·	—	—	104·6	25.315	N.E.	Do.		
December	29·465	82·62	8·1	85·8	77·2	—	—	103·	8·220	N.E.	Do.		

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. The climate is a very dry and healthy one; the thermometrical heat is high, and the daily range not great. High winds prevail generally from the end of May to the end of August, raising a considerable dust, but not apparently with any injurious effect. The most unhealthy months are at the commencement of the north-east monsoon, when cholera generally shows itself in an epidemic form, and also dysentery and diarrhœa in November and December. The months of March and April are the hottest time at the station when fevers of the intermittent and ephemeral type prevail. 4. There is no district near the station the climate of which is more conducive to health. 5. No reply to this query.
III. Sanitary Condition of Station.	1, 2, 3, 4. A map of the surrounding country, with a plan of the station, is transmitted. There are no barracks; the sepoys are hutted in lines. All the drains are open, and have a free escape. The drainage is admirable, the whole station being situated on ground sloping from 1 in 30 to 1 in 100 to the north-west. 5 to 8. These queries are not applicable to native troops. 9. The huts are constructed of mud wall with tiled roofs. 10. Not applicable to native troops. 11. A sanitary committee is responsible for the sanitary state of the cantonment, and an establishment is kept up by government. The hospital and place of arms are whitewashed whenever necessary. 12 to 15. No reply to these queries. 16. No part of the hospital is damp. The cesspits are more than 300 yards from this building. There are no foul ditches. 17. The surface cleansing of the cantonment is performed effectually by an establishment kept for the purpose. 18. The surface of the cantonment is kept free from vegetation. The fort walls interfere greatly with the ventilation of the fort, but they are being gradually pulled down. 19. The sanitary condition of the bazaar, which is small, is efficient and good. Its cleansing is efficiently attended to and performed by an establishment kept for the purpose. The native houses are of very inferior construction, and rubbish heaps are frequently kept within their yards. 20. Very few animals are slaughtered at the station, the number being about 10 sheep a day, and 4 oxen a month. No nuisance is experienced from the slaughtering places. 21. No reply to this query. 22. There are no cavalry or artillery stables at this station, neither are there any picketing grounds. 23. Not applicable to native troops.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is very good. The cantonment is on a slope, and drains itself into the surrounding tanks. No improvements are suggested.
IV. Health of the Troops.	1. The station, district, and adjoining native population may be pronounced as decidedly healthy. 2. The most prevalent diseases are fevers of an intermittent and ephemeral type during the hot months of March and April, and cholera and bowel complaints at the commencement of the north-east monsoon. 3. The healthiness of the neighbouring native population is attributable to the ground on which the fort is situated, being high, the soil dry, and the drainage efficient. The population also is not crowded. 4, 5. No reply to these queries. 6 to 16. No experience of hill stations. 17. With regard to whether there is any higher ground which could be advantageously occupied as a hill station, such stations are not necessary for native troops. 18. Gravelly and light soils, with a substratum of sand, are generally the most healthy. 19. The best period of life for soldiers to proceed to India is at 18 years of age, and they should land there in the cold season, from November to February. Freedom from exposure to the sun and from temptation to drinking are the best means of preserving the health of recruits on first landing. 20. Cannot say whether troops should be sent direct from the home depôts to India or sent to an intermediate station for a certain time; or whether they should be sent to hill districts on first landing, or how disposed of. 21. No reply to this query. 22. The period of service of a British soldier in India should be 10 or 12 years. 23. No experience of the manner in which the business of medical boards is conducted either at stations or at the presidencies. 24. Invalids leaving India for home should not depart later than the end of February or the beginning of March.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*—*Diseases.*	1. There are no regular inspection parades for the discovery of incipient diseases at the station. 2. There has been no scorbutus at this station. 3, 4, 5. No data exist upon which to form an opinion either as to the proportion of hepatic disease, dracunculus, or venereal disease. 6. The following diseases of endemic or epidemic class are those which the troops at the station suffer from:— *Fevers* of the ephemeral and intermittent type occur during the hot months of March and April. *Dysentery*, *Cholera* } Occur during the north-east monsoon. *Small-pox* has never occurred to my knowledge in an epidemic form among the troops stationed here. *Rheumatism* is not, I believe, particularly prevalent. No data are available to determine what is the proportion of admissions and deaths from these diseases to the total admissions and deaths. 7. The only zymotic diseases known at this station, as far as my experience goes, are cholera, variola, and very rarely rubeola, which are prevalent in the cold season at the commencement of the north-east monsoon, when there is a considerable moisture in the atmosphere from rain fall and a diminution of temperature. These diseases are not more prevalent in one part of the station than another, and I am aware of no particular habits and conditions among the troops or native population which predispose to these diseases. 8. Cannot say to what extent the prevalence of epidemic disease is influenced by the nature o the soldiers' duties and occupations in barrack, or habits on the march or in the field. 9. With regard to whether quinine has been tried as a prophylactic against malarial diseases at the station, malarial diseases are not prevalent here. 10. No reply to this query.
V. Intemperance. VI. Diet.	Queries under these heads do not apply to native troops.
VII. Dress, Accoutrements, and Duties.	1. The soldiers' dress at this station is decidedly not suited to the climate. The dress of a native soldier should be loose like that usually adopted by themselves, and not tightly fitting or of thick cloth.
Duties.	1. This query does not apply to native troops. 2. The best hours for drills, parades, and marches are in the morning. They should not last after seven o'clock. 3. No reply to this query.
XII. Hospitals.	1, 2. The site of the hospital is open and freely ventilated, and there are no walls, trees, or buildings interfering with ventilation. It is healthy in every respect. 3. There is an abundant supply of good wholesome water, procurable from a well immediately outside the hospital compound. 4. The drainage is simple, carrying off all refuse water readily to the neighbouring tank, to the north of the cantonment. 5. The surface drainage and guttering round the hospital is sufficient for carrying away the rainfall rapidly. The hospital is built of brick and chunam, and is a cool and pleasant building. It is supplied with verandahs, which afford sufficient shelter from the sun's rays. The hospital accommodation is so extensive that the verandahs are not required for the accommodation of sick, convalescents, or others. The building consists of one flat, and is so placed as to receive the full benefit of the prevailing winds. The windows open horizontally, and have both glass and venetians, and answer all the purposes needed for ventilation and coolness. 6. The doors and windows are sufficiently large and numerous to keep the wards at all times free of odour and closeness, besides which there are ventilators in the upper parts of the walls near the junction of the roof, supplied with weather boards, which can be opened or shut at pleasure. The jalousies or jhilmils are in the usual style adopted in India. 7, 8. There are no means of cooling or warming the wards. The walls and ceilings of wards are cleansed and lime-washed once every six months. 9. The privies are built of brick and chunam. They are thoroughly cleansed daily, and are not placed over cess-pits. They are not offensive. 10. This query is not applicable to native troops. There is, however, one bath for the sick in case of emergency. 11, 12. Not applicable to native troops. 13. The storage is sufficient and dry. 14. The cots are made of iron, and the bedding consists of a straw paillasse and quilts and cumblies. 15, 16. Do not apply to native troops. 17. Orderlies are allowed to attend on the sick on the doctor's application. 18. The sanitary condition of the hospital is excellent. No epidemic disease, hospital gangrene, or pyæmia have appeared in the wards. 19. There are no deficiencies or sanitary defects which require improvement. 20. There is no special provision made for convalescents. 21, 22, 23. No reply to these queries. 24. There are no convalescent wards or hospital, and such provision is not required, as there is only a native regiment here.
XIII. Burial of the Dead.	1, 2, 3, 4. No reply to these queries. 5. The dead of bazaar people are burnt or buried according to caste. 6, 7. No reply to these queries.

(Signed) W. K. Babington, Lieutenant-Colonel, Commanding Palamcottah.
Geo. V. Winscom, Captain Engineers, District Engineer, Tinnevelly.
Fred. L. Clementson, Zillah Surgeon, Tinnevelly.

17th October 1860.

RANGOON.—BRITISH BURMAH.

Accommodation
- European Troops
  - Artillery: Non-commissioned Officers and Men 164; Women 24
  - Infantry: Non-commissioned Officers and Men 869; Women 48
- Native Troops
  - Artillery - Non-commissioned Officers and Men 84
  - Infantry - Non-commissioned Officers and Men 3,600

References to Subjects and Queries.	Replies.
I. Topography.	1. The country to the south and west of the station is flat, covered with jungle, swampy, and intersected with numerous creeks flowing into the Irrawaddy and Pegu rivers. On the north it is undulating, with forest trees and thick underwood. In this direction it is, generally, sandy and dry. The whole country for miles round is covered with forest trees and low jungle. During the monsoon the country is under water. 2. The height of the station above the sea varies from the sea level to about 80 feet, and its height above the adjacent country varies to the extent of about 70 feet. There is a freshwater lake or tank about a quarter of a mile to the east of the station. It is the only one of any size in the vicinity. The river Irrawaddy flows past about the same distance to the westward. There are numerous creeks and nullahs in the surrounding country, but none of sufficient size to require special notice. There is no higher or healthier ground adjoining the station. The cantonment is situated on a spur of a hill, on the highest point of which is the Great Shoey Dagon Pagoda, the base of which is almost 100 feet higher than the cantonment, and is admirably calculated for defensive military purposes. 3. There are no mountains or table land within sight of the station or within 100 miles. 4. The nearest water of any size is the lake or tank already mentioned, about a quarter of a mile distant, and the Irrawaddy river at about the same distance. The vicinity of the station is not liable to overflow from the river, but during the monsoon, from May to October, it is under water from the heavy rains, which soon runs off or dries up. In the course of a month or six weeks after the rains the country is dry. The surrounding ground is broken, and there are ravines, but there are no water pits except a few near the artillery barracks, and the committee is not aware that they have produced any injurious effect on the health of the troops, although it is most desirable that the said pits should be filled up, as it is believed that their existence is one cause of beri-beri. 5. The station is open and freely exposed to all winds. There is nothing calculated to affect, materially, the free external or internal ventilation of the station. The temperature is not raised by reflected sun heat. There are no ungenially cold, variable, or land winds. The sea breeze blows freely at certain seasons, and is most conducive to health. 6. There are patches of cultivation here and there, generally the surrounding country may be said to be cultivated. There are no works of irrigation in Burmah. The lake to the eastward of the station may be used for the purpose to a very limited extent, but not so as to produce any effect on the health of the station. No description of grain is allowed to be grown in military limits. Rice is grown to a considerable extent on the western bank of the Irrawaddy, distant four or five miles; and it is also grown to the eastward and south of the station about the same distance. The Committee is not aware that indigo, hemp, or flax are grown in or near the station. 7. The nearest town is Rangoon, which is close to the station, and on the same side of the river Irrawaddy, along the bank of which it extends six or seven miles. The population is composed partly of Burmese and partly of natives of India, with a few Europeans. 8. The surface and subsoil in the vicinity of Rangoon consist of a series of clay and sandstone, with a large development of laterite. This rock is met with on the spurs and ridges which terminate the Zoornah range of hills at this place, the Great Shoey Pagoda being erected on the highest spot to the north-east of the station. The plain below consists of clays and sandstones, each occasionally predominating, the former being sometimes of a very aluminous kind like pipe-clay. The surface soil is always clayey and alluvial, but at varying depths the subsoil becomes gritty or gravelly, from the admixture of nodules of a brick red and dark brown colour. These nodules are more numerous as we descend, and at length give the rock a conglomerate alluvial character, resembling a nodular clay ironstone, constituting, in fact, the laterite before alluded to. The alluvial soil of the cantonment has, by analysis, been found to contain 50 to 70 per cent. of alumina; such being the case, it may be concluded that drainage by percolation must be insufficient. Generally speaking, as the ground of the cantonment slopes to the south and west with considerable gradients, the water is readily carried off, and the roads soon become dry after rain. But in some of the lower parts of the cantonment, where the surface soil is of a very retentive character, much artificial drainage and improvement are required. 9. The depth at which water is found varies at different parts, but on an average water is usually found during the dry season from 25 to 30 feet below the surface; during the rainy season from 15 to 20 feet. 10. There are no surface springs, but the rain-fall flows very readily away or sinks into the porous subsoil, and is drained off, and does not ooze out again; this as regards the station. In the surrounding flat country much remains on the surface, and is dried up during the hot months. There is no higher ground, the drainage from which must necessarily pass into the subsoil of the station. 11. The water supply is derived from wells and one or two tanks. The dhoby or washermen's tank and the Scots tank to the north of the Great Pagoda might be used for the like purpose. It is most desirable, considering its site, that the latter should be reserved for this purpose. From the use made of it by the commissariat it is, at present, utterly useless for drinking water, and is becoming less so every year. There is an extensive sheet of water east of the cantonment; there are other smaller tanks (ponds) within the boundary of the cantonment. Drinking water is usually obtained from wells not from tanks. The low swamp between the 41st lines and its mess-house might, with great advantage, be dug out and formed into a reservoir or tank for water. This measure is particularly recommended as a sanitary precaution.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	The tanks are never dry and are brimful during the rains. There are fish of different kinds in them, and there is a water plant in them (name unknown to the committee) which prevents the water becoming decomposed, and keeps it always sweet and wholesome. There is a small tank near the 41st mess-house adjoining the Prome road (east), that is always dry during hot weather. There is a luxuriant creeper spreading over the surface of many of the tanks, which has the property of keeping the water at all times pure and sweet. No tank used for supplying drinking water is also used for bathing, and none of the tanks are liable to pollution from leaves, drainage, &c., getting into them. The committee is not aware of any nuisance or malaria proceeding from the tanks. 12. The amount of water supply is ample, with the exception of the hot months, when the supply in the wells becomes scanty. The water is of most excellent quality, as regards colour, taste, and smell. When drawn it is of a whitish colour, particularly at the commencement of the rains, when it is very dirty, but soon deposits a sediment and becomes comparatively clear; after filtering it becomes perfectly so, it being then very pure and tasteless. The water is soft and contains very little lime and no animalculæ, and the sanitary officer considers it by no means injurious to health if filtered. It is raised and distributed by bheesties or water-carriers. The committee is not aware that any better means could be devised, unless some machinery were introduced. 13. The committee is not aware of any other topographical point requiring notice besides the above. 14. As regards the present procedure in selecting new stations, sufficient attention has not hitherto been paid to the important considerations of topography, climate, diseases, &c. Generally cantonments have been placed on low ground, as being more convenient for water supply, which is highly objectionable. In the selection of a site for a cantonment a board of experienced officers should be appointed to make the necessary sanitary inquiries, and, if possible, a previous trial of the spot should be made by troops before erecting permanent buildings.
II. Climate.	1. The meteorological instruments at present available at the station are thermometers, barometers, hygrometers, and rain gauges, but no adequate means or instruments have hitherto existed in this province, and no records embracing all the necessary observations have been kept. Complete sets of instruments have, however, been lately received, and are to be put up and scientifically observed. Properly instructed persons and a suitable department are needed for this purpose. 2. The following table gives the result of eight months' observations.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Rain.*	Winds.		Remarks.
									Direction.	Force.	
1852.	In.	°	°	°	°	°	°	Inches.			
November	30·06	81·09	14·04	88·11	74·07	81·79	74·80	—	N.E.	Moderate	Generally clear.
December	30·094	76·70	18·00	85·7	67·70	78·13	69·33	0·21	E. & N.E.	„	Fine and clear.
1853.											
January -	—	77·22	22·22	88·33	66·11	77·78	67·82	—	N.E.	„	Fogs frequent.
February -	—	77·45	28·90	91·9	63·01	78·93	69·85	—	Variable	—	Fogs frequent.
March -	—	82·90	23·45	94·63	71·17	83·73	75·93	0·15	—	Light -	Fine, with occasional thunder and lightning and gusts of wind.
April -	—	85·5	21·00	96·00	75·00	87·28	78·48	0·9	W. & S.W.	Moderate	Clouds accumulative; squalls of wind.
May -	29·779	83·92	14·40	91·13	76·72	84·83	76·60	8·04	W. & S.W.	Squally -	Cloudy, with rain; opening of S.W. monsoon.
June -	29·745	80·106	6·40	83·37	76·95	80·72	78·29	15·01	S.W.	Strong -	Cloudy, with rain.

* About 80 inches usually fall during the monsoon.

3. The climate is dry from the middle of October until the middle of May. Heavy dews and mists prevail during January, February, and March. The day heat is excessive from March till May, but a refreshing sea-breeze generally sets in about 4 p.m.; nights and mornings cool. Thermometer usually varies about 20° during the 24 hours.

An extensive forest with much underwood on the north side. The river Irrawaddy and several creeks on the south and west. Cantonment very dusty in dry weather owing to long drought and the bad materials (only kind procurable) of which the metalled roads are made.

Rangoon is found to be healthy for Europeans, but not so for native troops, owing principally, it is considered, to the want of nourishing meat diet. Throughout the year light woollen clothing should be worn by both Europeans and natives. The shelter afforded by the present wooden barracks is insufficient (executive engineer says "is ample"), and some of the barracks of the natives are not sufficiently raised from the ground. As a general rule, all drills and exercise in this climate should take place before 7 o'clock a.m., and should not exceed one hour. Night duties should be restricted as much as possible, and a man should not be brought on guard duty oftener than once in four days.

The hot months, from March till May, are considered the healthiest. The wet months and those immediately preceding are the most unhealthy. During the wet season bowel complaints are prevalent among Europeans, and during the wet and cold season fever and beri-beri prevail among the natives. The sanitary officer is of opinion that when the monsoon is copious, that is, of normal amount, the wet season would appear to be healthier than

RANGOON. BRITISH BURMAH. MADRAS.

References to Subjects and Queries.	REPLIES.

II. Climate—*cont.*

either the cold or hot season, there being no evaporation, and great equability of temperature. In his opinion the drying up of the numerous shallow ponds or tanks causes fever, bowel complaints, and beri-beri.

4. Thyet Myo, about 200 miles up the Irrawaddy river, is reported to be a healthy and desirable station for European troops, especially on their first arrival from Europe. It is 160 feet above the level of the sea. Its surface and subsoils are a series of sandstone and gravel to the depth of 25 feet or more, beneath which is a retentive stratum of calcareous clay. The surface is undulating and drainage good. The water supply is excellent, and is found at a depth of 25 to 35 feet. Its climate is many degrees cooler than that of Rangoon, the thermometer ranging from 45° in the cold months to 104° in the shade in the hottest weather. It is reached by water in 8 days. (*Vide* Appendix to this Report.)

5. As regards the comparative healthiness of stations. It appears that stations situated in valleys, on low ground, or near stagnant water, are unhealthy, while those on high table land are generally the healthiest, but there are other circumstances relating to the subsoil and surrounding country which also require to be considered.

The following table, showing the relative salubrity of a few of the principal stations as regards European troops, is taken from various reliable sources.

Stations.	Periods.	Deaths per 1,000 of Strength per Annum.
Bangalore	10 years, 1829 to 1838	28·03
Cannanore		37·69
Trichinopoly		39·34
Masulipatam		51·00
Secunderabad		71·68
Rawul Pindi	6 years ending 1854–5	27·60
Jullundur	9 „	28·06
Dugshai	5 „	29·8
Sholapore	20 years ending 1849	22·25
Kolapore		20·5
Thyet Myo	2 years, 1858–9	29·75*

* Including 6 deaths by cholera in 1859. Deducting these, the mortality would be 19·6 per 1,000.

III. SANITARY CONDITION OF THE STATION.

1, 2, 3. Maps and plans of station, &c. The country to the south and west, on the other side the river, has not yet been surveyed. Every road in the cantonment has a ditch or drain cut on each side of it, and by these ditches the cantonment is drained. There are no covered sewers. The general slope of the cantonment is to the south towards the Rangoon river, which receives the drainage.

4. The following table shows the barrack accommodation :—

Date of construction, 1852–53–54.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Beds above the Floor.	Windows. Number.	Height.	Width.
		Ft. in.	Ft. in.	Ft. in.	Ft.			Ft.		Ft. in.	Ft. in.
European Infantry.											
18 - - -	50	140 0	45 0	18 0 average.	113,400	2,200	120	2	24	5 6	4 6
European Artillery.											
5 - - -	50	140 0	45 0	18 0	113,400	2,200	120	2	24	5 6	4 6
Native Infantry.											
20 - - -	60	90 0	20 0	16 0	28,800	460	30	–	4	4 0	4 0
240 huts - -	10	16 0	16 0	10 0	2,560	256	25½	–	–	—	—
Guard Rooms.											
European Infantry -	12	33 0	26 0	14 0	13,012	1,080	71	2	–	—	—
European Artillery -	6	30 0	20 0	14 0	8,400	1,400	100	2	–	—	—
Native Infantry -	14	25 0	20 0	15 0	7,500	535	35	–	–	—	—
Prison Cells.											
European Infantry -	1	9 10	9 8	9 4	877	877	94	2	–	—	
European Artillery -	1	10 0	10 4	18 5	1,860	1,860	103	2	–	—	—

5. The windows are on opposite sides of the barrack rooms, and open inwards like doors. There is no verandah, as this term is used in India, but the roof on both sides of the building is carried out about 10 feet beyond the outer wall, and forms what is usually called a "pandall," the floor of which is the ground, and much lower than the floor of the building itself. This pandall is never used as a sleeping quarter by soldiers or others. There are no jalousies or jhilmils in the barracks of the European troops. The windows are glazed. In those for the native troops they are plank or mat.

6. The artillery bedsteads are of wood, those of H.M.'s 68th Light Infantry are partly wood and partly rattan. The latter are preferred by the men, and recommended by the committee. The bedding consists of a small cotton carpet, a quilted quilt, and a blanket. No bedsteads are allowed to native troops in barracks, nor bedding, they provide the latter themselves.

7. European tents are 21 feet long by 15 feet broad, 5 feet high at the sides, and 10¼ feet in the centre, giving 315 superficial feet, and 2,441 cubic feet of space. They are intended for 25 men, giving to each man 12½ superficial, and 97½ cubic feet. A native tent is 22 feet

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	long, with an average breadth of 11 feet; height in centre 8 feet, and at sides 1¾ feet; it holds 25 men. The tents are made of thick white cotton cloth, doubled or trebled, and lined with blue cotton cloth. The European tent has a double fly, with a distance of a foot and a half between the flies. 8. Barracks and guard-rooms in Burmah are ventilated by doors and windows, and also by a narrow opening of from 4 to 6 inches all along the top of the side walls. This ventilation is, generally speaking, sufficient, but it might be improved by having ridge ventilation along the top of the roof. Tents are ventilated by doors and windows, and when necessary, by lifting up the sides; but the new mode of ventilating tents recently adopted in England should be introduced into this country. The air in barrack-rooms is cooled by punkahs, formed of a framework of wood 16 feet long by 3 feet wide, covered with cloth, suspended from the roof by ropes, and pulled by men, so as to oscillate like a pendulum. The air is thus set in motion, producing the same effect as is caused by a fan. There are generally five such punkahs in a barrack-room; cost of the five about 200 rupees. 9. Barracks and huts in Burmah are built of wood and bamboo mats, with thatched roofs; tents are of cotton cloth. 10. Floors are generally of plank, some few of bamboo; they are raised from 2 to 8 feet above the level of the ground, allowing a free passage for air underneath. 11. Wooden barracks are not well suited to the climate, being damp in wet weather, and not affording sufficient protection in the hot season. Substantial masonry barracks raised on arches or pillars are recommended by the Special Committee, to be constructed of two stories, so as to admit of the lower part being used as exercising ground, ball court, skittle alley, &c. (I differ from the committee in their answer to this question. I consider that wooden barracks with shingled roof and boarded ceiling are greatly to be preferred to masonry barracks. The former are undoubtedly cooler at night, and from an experience of nearly five years, I should say, are certainly not damp, whilst they are not liable to destruction by earthquakes, which are not unfrequent in Burmah. (Signed) Jas. Bell, Major-General, Commanding Pegu Division). The barracks and cantonment are kept in repair by the Public Works Department. Repairs are executed as quickly as circumstances will admit of. The sanitary officer, who is the senior medical officer, is held responsible for the sanitary state of the cantonment.* Masonry buildings are whitewashed once a year, hospitals oftener if necessary. 12. There are lavatories, but no baths. (Sketch appended.) 13. Food is cooked in metal boilers and saucepans, and occasionally in earthen vessels. The method is most simple. Fires are lighted on the ground, or on a raised brick platform or fireplace running round the cookhouse, the boilers being placed on stones or bricks put round three sides of the fire. Native cooks generally superintend the cooking of soldiers' food. Water carriers bring the water required. Refuse matter is carried away to a distance by the cooks and sweepers. Linen is taken away by dhobies, who wash it in the neighbouring tanks. The conveniences are quite sufficient. 14. In the privy arrangements the ordure is received into wooden boxes lined with zinc, and these are daily carted to a distance, and the contents there emptied. 15. Barracks are lighted at night by oil lamps suspended from the roof in glass globes. Glazed windows are required. 16. The drainage is by open drains dug so as to carry off the rain water, &c. Where the barracks are on high ground the water runs off readily. The drainage is not sufficient in some parts where the ground is low. In low parts the water is allowed to stand and evaporate. The buildings used as barracks or hospitals are damp during the monsoon. The marshy ground near the 41st Regiment's lines is about 200 yards from the hospital and barrack. There are no foul ditches. 17. Surface cleansing within the cantonment is done to some extent either by removal to a distance or burning of refuse substances. It is not efficiently done. 18. During and after the rains there is much vegetation on the surface of the cantonment, but it is easily removed periodically. More might be done in this respect than is done, but upon the whole the station is kept pretty free from vegetation. The committee is not aware of the existence of any old walls, hedges, or other obstructions to ventilation. 19. As regards the sanitary condition of the bazaar. The bazaar has good open drainage. The ventilation is good, and the water supply abundant. It is kept very clean. There are private latrines, but no public ones; they are not offensive. The bazaar is not crowded. The conservancy of the station is under the jurisdiction of the cantonment magistrate, who has ample powers, under specific regulations, to ensure its sanitary condition. The committee has no suggestion to offer on this point; but although beside the questions under consideration, the committee would take the liberty of offering an opinion that, as a question of military organization and expediency, it would be desirable that the officer exercising this jurisdiction should be under the military authorities only, and not be, as he is, partly under the military and partly under the local civil authorities, as such joint jurisdiction is calculated to lead to clashing between the two authorities. The native houses near the station may be said to be in a dirty state. The military authorities have no jurisdiction beyond military limits and cannot interfere. Some other and better arrangements are required in regard to the removal and places of deposit of night-soil. This is now deposited at a spot to the eastward of the Great Pagoda, on the road leading to the artillery practice ground, and is most offensive. The atmosphere near is poisoned with the stench. If pits were dug and filled up from time to time it might lessen the evil.

* *Extract from Cantonment Orders.*—"Commanding officers and heads of departments will send in to the brigade office by the 25th May, a report to the effect 'that the localities and lines respectively are cleared of all rubbish, old thatch, &c., and are in a satisfactory sanitary condition.' These reports are to be first sent to the sanitary officer for countersignature, and that officer will satisfy himself that he above order has been properly carried out."

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	None of the barracks except those on the eastern platform of the Great Pagoda are sufficiently near to the place of deposit to cause the wind blowing over it to be much felt. The committee is not aware that any nuisance is experienced from the wind blowing over native dwellings. 20. Cattle for the use of troops are slaughtered within cantonment limits at a place to the eastward of the Great Pagoda. All arrangements connected therewith are made by the commissariat officer. It is not sufficiently near barracks to be a cause of nuisance. Committee have no suggestion to offer; but, as connected with the subject, they would remark that at times, when cattle or elephants die near the cattle sheds the nuisance is great for those who may be taking exercise in that direction. They would suggest whether it would not be advantageous to have sick cattle lines at a greater distance, and that the dead animals should be buried, instead of being kept to decompose on the surface as is now done. 21. The only ponies in the bazaar are those belonging to the hack carriage proprietors, who are, under regulations, obliged to provide proper stabling for them, and to remove the manure, &c. This is properly attended to. There are no horses or ponies belonging to the camp followers, nor are there any picketing grounds for horses or ponies in or near the station. 22. The artillery battery horses are picketed under sheds made of thatch. They are about 300 yards to the north of the barracks, and 500 to the north-east of the hospital. The sheds are open all round; there is one dung-heap to the north of the sheds or stables, and about 200 yards distant. The remainder of the dung is removed daily to a distance in the surrounding jungle. The following are extracts from the Cantonment Regulations:— "i. It is the duty of the executive engineer to attend to the general conservancy of the station, and he is required to draw the attention of the officer commanding to any instance in which the precautionary rules against fire have been neglected. "ii. The conservancy of the Sudder bazaar rests with the officer in charge, and commanding officers and quartermasters of corps and detachments and heads of departments are required to attend to the cleanliness of their own lines or premises. "iii. No nuisances are permitted within the cantonment south of Tiger Alley and Arsenal road, or west of Lake road. "iv. Residents in cantonments are consequently required to have trenches dug within their respective compounds for the use of their dependants. These trenches are to be filled up and renewed as often as deemed necessary by the medical officer in charge of the lines in which the compounds may be situated. "vi. Towards the end of each monsoon all compounds and regimental lines are required to be cleared of all jungle, weeds, and rank vegetation; fences to be repaired, and hedges cut according to regulations. Officers commanding regiments and heads of departments will, on or before the 1st November in each year, report to the brigade majors that this order has been complied with by all under their orders or residing within the lines under their charge." (True extract.) A. S. STEELE, Captain, Brigade Major." 23. There are no quarters specially built and set aside for married non-commissioned officers and men. The married non-commissioned staff have quarters, as is customary in India. The Artillery have what is called a patchery, which the married men occupy. The families of the 68th Light Infantry have not yet joined head-quarters, but some large buildings, formerly used as a detail hospital for natives, have been set apart for them. There are no married families living in the same barrack with the men. The native troops have not their families with them.
Officers' Quarters.	There are no public quarters for officers. They occupy private bungalows in the vicinity of their barracks. The committee is not aware that they are unhealthy, although the ground on which many of the bungalows are situated might be improved by being properly and systematically drained. The committee is of opinion that it would be advantageous if officers were supplied with public quarters, and it is suggested that in European regiments, the adjutant and quartermasters should be in or near the barracks.
IV. HEALTH OF THE TROOPS.	1. The station, the district in which the station is situated, and the adjoining population are very healthy. 2. (No reply to this question.) 3. (No direct reply to this question. But under 2 and 3, both of which relate to the sanitary state of the *native population*, the following information regarding immigrants from India is given.) The natives residing within the limits of the cantonments, who are chiefly from Madras, Calcutta, and Cocanada, appear to be healthier than the troops, which may be attributed to their having better food and no night duty. The unhealthiness that exists among the native troops may be accounted for by the neighbouring swamps and the want of drainage in the lower parts of the cantonment. The men being without their families have no one to cook their rice, which is another cause of their being unhealthy. N.B. by the executive engineer signing these proceedings. "I do not know of any lower "parts of the cantonment which require draining."—(Signed)—E.L. 4. The following are the stations at which the troops served before coming here:— D company, 1st battalion, Madras Artillery, from Secunderabad in 1856; was there 10 years; left 26th January 1856. State of health there, fair; diseases, hepatitis and fever. State of health on arriving at Rangoon, 23rd April 1856, good. Since arrival, suffered from dysentery and hepatitis. D company, 4th battalion, Madras Artillery, from Kamptee in 1856, was there nine years, left 15th October 1855. General health there good; diseases, hepatitis and fever. State of health on arrival at Rangoon, 21st January 1856, good. Since arrival, suffered from hepatitis, dysentery, fever. H.M. 68th Light Infantry; Rangoon, first station in India. State of health on arrival, 23rd March 1858, good; since experienced dysentery, fevers, bowel complaints.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	6th Regiment Madras Native Infantry, from Bangalore in April 1857; there two years, left February 1857. State of health there, very good; diseases, fever and rheumatism. State of health on arrival at Rangoon, good, and for a year afterwards. Suffered during the last year of residence from diarrhœa, rheumatism, beri-beri, fever. Casualties about 65 in Burmah and India during three years' service. Returned to the coast 24th March 1860. Although numerically stronger than the 23rd or 41st Regiments, was far more healthy, attributed to the 6th being in better barracks and well raised from the ground. 23rd Regiment Light Infantry, from Russelcondah in 1858; was there one year 11 days; left 15th March 1858. State of health there, good; diseases, intermittent fever and rheumatism. State of health on arrival at Rangoon in April 1858, good; since arrival has suffered from diarrhœa, rheumatism, beri-beri, fever. 39th Regiment Madras Native Infantry, from Thyet Myo in 1860; was there three years; left 9th February 1860. State of health there very bad for a period from fevers, beri-beri, bowel complaints. State of health on arrival at Rangoon in February 1860, fair; since arrival, suffered from diarrhœa, rheumatism, fever, beri-beri. 41st Regiment Madras Native Infantry, from Secunderabad; was there one year; left 13th March 1858. General health there, good; diseases, intermittent fever, rheumatism. State of health on arrival at Rangoon in April 1858, bad; since arrival suffered from beri-beri, dysentery, rheumatism, fever. The committee is not aware of any portion of the men's accommodation at Rangoon being more unhealthy than the rest. 5. The troops are not camped out here. 6. I was in command at Mercara, a hill station near the western coast of Southern India. The garrison consisted of the 28th Regiment Native Infantry, and about 30 European artillery-men. The climate was found to be highly favourable for all. 7. I have not observed that troops who have been resident at hill stations have been more liable to disease on returning to the plains. 8. I think it would be highly beneficial for European troops to select hill stations. 9. I do not remember any diseases with which troops are liable to be attacked on going to hill stations. 10. Men going to hill stations require to adopt precautions as to warmer clothing, and avoidance of sleeping exposed to the night air. 11. I know of no exceptions as to the times best adapted for residence at hill stations. During the cool season the plains, also, are always agreeable. The period of residence at the hills should not be under two years. 12. There is no period beyond which residence on the hills would produce injury to health. The longer troops are kept on the hills the more they become fitted for service in the plains. 13. I know of no special precautions required for protecting the health of troops on leaving hill stations for the plains. 14. As regards the question of relative periods of residence on the hills and in the plains, I am quite satisfied that troops which had enjoyed the benefit of a bracing climate would be more fit for service in the plains than if they had been all the time under the enervating effects of the burning sun of the plains. The committee is of opinion that troops, European and native, should never remain longer than three years at one station. Frequent change is beneficial to health and discipline. The great objection, however, to this arrangement is the ruinous expense to which the troops would be put for carriage. 15. With reference to the kind of accommodation for sick at hill stations, there was an excellent hospital erected at Mercara, the station already mentioned, and it was no doubt highly advantageous to the recovery of the sick. 16. I have never heard of the Neilgherries or Pulney Hills being visited by any epidemic, though I believe dysentery was present in one of Her Majesty's regiments when first it was stationed at Coonnor. The height of these hills is from 6,000 to 7,000 feet. The Shevaroys near Salem, and Nundoomungalum near Trichinopoly, have both had seasons of unhealthiness, but I have not heard of any such visitation within the last 20 years, or more. They are, the former, I believe, between 5,000 and 6,000 feet, the latter 4,000 feet above the level of the sea. Mercara is, I think, under 3,000 feet, and Ramanuddy near Bellary is not more than 2,300 feet above the level of the sea. I have never heard of either of these places being unhealthy, and from all I know of any of these localities, I should say they are admirably suited for European troops. 17. There is no high ground near the station, but Thyet Myo would, it is considered, be found a more desirable station than the present one. The Major-General does not at all subscribe to this opinion. Thyet Myo is 200 miles off, and only during the cold season can it be said to be more bracing than this place, and for native troops decidedly more unhealthy. 18. As regards soils for stations, those subsoils that admit most readily of percolation are the most healthy. All surfaces into which alumina largely enters retain moisture, and exert an insanitary influence. Surface soils in which oxide of iron abounds, are considered to conduce to epidemic fevers. On the other hand, the most feverish places have been where the soil is black cotton. 19. The best age for soldiers proceeding to India is 20 years; and they should arrive at the beginning of the cold season. Troops are disposed of on landing according to local arrangements, and the precautions must depend entirely on local circumstances. 20. In sending troops to India, it would certainly be advantageous, as far as health is concerned, to acclimatize them at intermediate stations. After landing in India, the balance of evidence is in favour of gradual acclimation by earlier residence at hill stations of moderate elevation. They should certainly be sent to those stations in their respective presidencies, which statistics and experience have proved to be the most healthy. 21. As regards modes of transport, on the Irrawaddy river troops are moved in large flats capable of holding 300 men, and towed by steamers. To the stations on the Sittang river they proceed in country boats, there not being sufficient depth of water in the river for the steamers now in use. Every precaution is taken to protect the health of the troops on the route. 22. A soldier should serve 10 years in India.

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	23. Medical boards or divided responsibility in any form is objectionable. Where an opinion on a single point is required, the decision of a board would appear to be desirable. A standing medical committee is far preferable to one constantly changed, particularly with a perpetual president. 24. Invalids should leave India for home in January and February.
Diseases.	1. There are disease inspections in some regiments once a week. They are not generally adopted in native corps, unless on particular occasions. 2. There is no scorbutic disease of indigenous origin at this station. Among natives such diseases are caused by the want of a proper nourishing meat diet. 3. The returns do not show the exact proportion of cases of hepatic disease under treatment at Rangoon. The following table embraces the whole Pegu division for 1858–59 :—

—	Per-centage		Died, to Cases treated per Cent.
	Of Total Admissions.	Of Total Deaths.	
Hepatic Diseases - -	2	11 1/7	4 5/9

Causes.—Residence in a tropical climate; exposure to the sun's rays; undue excitement of the liver by the use of fermented liquor, especially ardent spirits. The immediate cause of acute inflammation is generally cold, or a chill experienced during sudden alternations of temperature.

The following per-centage of admissions of hepatitis to strength among different classes of soldiers, has been ascertained from the medical returns of six European regiments serving in the Madras Presidency in 1849–50 :—

—	Teetotallers.	Temperate.	Intemperate.
Per-centage to Strength -	5·77	5·766	10·191

The disease cannot be considered the consequence of other diseases. *Prophylactic measures recommended,*—

1. Avoidance of the solar heat in the hotter months of the year.
2. Moderation in diet and drink, especially the disuse of spirits.
3. Precautions against cold or chills, especially after fatigue or at the close of the hot season.
4. Protection of the abdomen by a flannel belt.

4. Guinea worm is not common among Europeans. It appears from the medical returns, 1829–38, that out of the aggregate strength of the Europeans of the Madras Presidency only 1 in about 1,880 admissions was from guinea worm; while among the natives the average was 1 in 562 admissions.

The only prophylactic measures which can be suggested is the avoidance of water, either for the purpose of ablution or drinking, in which the microscope detects the presence of any worm like the tank worm, described as the probable cause of guinea worm.

5. The returns do not show the exact proportion of venereal disease among the troops. Prostitutes in Burmah do not generally reside in the cantonment, and it seems doubtful whether lock hospitals would be of much avail.

6. The European troops suffer in a limited degree from fevers of the ephemeral, intermittent, remittent, and continued types; also from dysentery, of the form usually met with on the continent of India.

The following table gives proportions per cent. to the total admissions into hospital and deaths in 1858–59 :—

Diseases.	Per-centage of Admissions.	Per-centage of Deaths.	Deaths to Cases treated.
Fevers - - -	16 1/2	9 1/12	8/11ths
Rheumatism - -	4 4/5	None.	None.
Cholera and Small-pox -	Not appreciable.	—	—

7. Fevers, and some forms of diarrhœa and dysentery may be considered the more common forms of zymotic diseases. The general characteristic of fevers is mildness, and amenability to treatment. Of dysentery and diarrhœa the occasional tendency is to pass on to the ulceration stage, without that intensity of the antecedent symptoms which might be expected. Dysentery and diarrhœa prevail during the rains and immediately after. Fevers prevail most in the hottest months.

As regards the native population, these diseases prevail more generally in the lower part of the cantonment. The cantonment is distant about two miles from Rangoon. The Burmese are naturally a dirty race, and an absence of all cleanly arrangements marks their dwellings. Drainage and water supply bad. Ventilation generally good. Dwellings not crowded, and but little disease among the civil population.

Among predisposing causes are the parsimonious habits of the native troops not admitting of sufficient nourishing food, and meat not forming part of their ration. Among Europeans the use of ardent spirits must no doubt predispose to disease in some cases.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	8. The proportion of disease is greatly influenced by night duties, by monotonous barrack life, and by want of amusement. On the line of march disease is greatly caused by exposure, fatigue, &c., and with native troops by the men having to look after their families. To remedy the latter evil the families should be sent on in advance. 9. In Burmah, malaria is not so rife as to have led to the use of quinine as a prophylactic. 10. The following means of mitigating or preventing disease are recommended:— *First.*—It appears to be of the greatest consequence to the health of Europeans that every practicable restriction should be placed on the use of ardent spirits. *Second.*—Much of the disease that prevails among native troops may be attributed to the separation of the men from their families; the difficulty of procuring animal food; their partaking of imperfectly cooked rice, which in Burmah is pounded without having been previously boiled, as is done in India. *Third.*—A thorough system of conservancy is required in this cantonment. At present ordure from the privies of the whole force is carted away nightly, and strawed broadcast over an extensive area on the N. E. side of the cantonment. The wind blowing from that direction during a great portion of the year, the atmosphere of the cantonment must be sensibly vitiated by the stench that arises. Regimental privies are not so fully deodorized as it is possible to keep them, nor are the barracks or hospitals as efficiently drained as they might be. But improvement in these particulars cannot be hoped for until the sanitary officer is provided with an efficient establishment, and empowered to carry out all necessary measures. *Fourth.*—The dusty condition of the roads of the cantonment must likewise be prejudicial to health.
V. Intemperance.	1. The soldiers at this station are generally temperate. There are no confirmed drunkards in the full meaning of the term. The following table, obtained from the superintending surgeon's department, shows the extent of disease, mortality, and crime among different classes of men:—

Total Strength of Europeans, 2,201, in Pegu Districts, 1858–9.	Teetotallers.	Temperate.	Intemperate.
	16	1,373	962
Of average strength each class admitted per cent.	—	169	135
Of treated died per cent. - - -	—	1¼	1½
Punished by courts-martial, per cent. - -	—	34	54¼

Drunkenness *per se* is invariably punished as an offence.

3. Distilled spirits are sold in the canteens and bazaar, but not to European soldiers in the latter.

The canteen is the only place where the European soldier can legally obtain spirits, which is of excellent quality. The average consumption per man in the Madras Artillery is 1⅔ drams per diem. In Her Majesty's 68th Light Infantry, ½ dram per diem.

Spirits form no portion of a soldier's ration in quarters, on the march, or in the field. The soldier can obtain spirits in the canteen on payment to a limited extent, but not before noon. The custom of dram-drinking in the morning does not now exist.

Spirits are never given as a ration to convalescents. No other intoxicating drinks are sold in the canteen, and the committee are not aware that such drinks are sold in the bazaars.

4. The committee consider that the moderate use of good and wholesome spirits is not injurious to health, while at times and under certain circumstances such use might be beneficial, but that the immoderate use of spirits is most injurious to health. It is also assuredly injurious to the efficiency and discipline of a corps.

5. The committee consider that, under existing circumstances, to abolish the sale of spirits in canteens would not be beneficial. The sale of it is sufficiently restricted under existing regulations. The sale of spirits in bazaars to European soldiers is prohibited under heavy penalties.

6. The use of malt liquor and of wines is most beneficial to health as compared with the immoderate use of spirituous liquors.

7. Tea, coffee, &c., are used at the station. Coffee shops with reading rooms have been largely introduced into the army of late years, and with great benefit to health, efficiency, and well-being of the soldier.

The use of such drinks as compared with the immoderate use of any intoxicating drink must necessarily be good, and have a most beneficial influence.

8, 9. If the sale of spirituous liquor were suppressed in the canteens, then the soldier would obtain it elsewhere, and would not substitute for it beer, tea, or coffee. Every means should be adopted to induce the soldier to substitute the one for the other, but the committee do not consider that this end could be obtained by suppressing altogether the sale of spirituous liquors in the canteens. But the gradual suppression of the use of ardent spirits is desirable unless when men are undergoing heavy work or exposure on field service, and when malt liquor cannot be obtained.

10. As regards recommendations, the committee consider that every encouragement should be given, and every aid afforded by Government for the establishment of a good coffee-room, &c.

The soldier should be able to obtain there anything, except intoxicating drinks, and at a moderate price. Such establishments should be as far as practicable from the canteen, and all places of amusement or recreation should be as near the coffee-room as possible. The canteen regulations provide for the establishment of such shops, but as they are dependent on the profits arising from the canteen, it would seem advisable that they should be put on a more desirable footing, and in a measure independent of the canteen.

11. The canteen regulations are contained in a general order, dated 17th August 1855. The rules are full and complete, and answer the purpose admirably.

References to Subjects and Queries.	Replies.
VI. DIET.	1. The ration for Queen's troops and European troops of the Indian army consists of 1 lb. bread, 1 lb. meat, 4 oz. rice, 2½ oz. sugar, ⅘ oz. tea, 1 oz. salt, 1 lb. vegetables, 3 lbs. firewood. At certain seasons of the year when beef (the only meat ration) is not very good, salt provisions are occasionally issued in lieu of beef; and yams and potatoes when green vegetables are not procurable. It is recommended that potatoes should at all times be issued as part of the soldier's ration, and that when fresh vegetables are not procurable, preserved mixed vegetables be issued instead. The rations are inspected regimentally by the officer of the day and by the quartermaster. 2. A complete ration with a due proportion of vegetables is provided for the troops at this station. Fruit forms no part of the ration. There is no stoppage for the ration. The soldier has three meals a day, breakfast at 8 a.m., dinner at 1 p.m., tea at 4 p.m. Breakfast consists of tea or coffee, bread, and a portion of the meat ration; the dinner consists of this ration; and the tea, of coffee or tea, and bread, with such additions as the soldier himself may feel disposed to provide. There is always 1 lb. of vegetables in the ration whenever procurable. 3. To improve the ration, mutton should be issued occasionally. Salt rations with peas once a week. The Chinese inhabitants of Rangoon rear pigs to a considerable extent. The pork is excellent, and it might occasionally form part of the meat ration. No arrangement necessary for preventing the troops selling their rations. 4. For cooking rations, each company has a cookhouse. Government provides copper boilers, gridirons, frying pans, ladles, choppers, and baskets. The commissariat provide for the regular tinning of the cooking utensils. The cookhouses (they can hardly be called kitchens in the usual meaning of the word) might be better. They are not sufficiently light. The supply of water is ample. The rations are sometimes boiled, sometimes roasted. The cooks are natives, and every thing considered, the cooking is properly done and sufficiently varied. Tea and coffee are prepared in accordance with the wishes of the soldiers. There are no complaints on the subject. It is, however, recommended that the means of roasting and grinding coffee be furnished by Government to the soldiers. In India it is the custom to have coffee for the men on the march. 5. A soldiers' garden, for cultivating vegetables, has been introduced in this station, and is extensively used by the European soldiers. Each applicant is allotted a piece of ground, and he is provided with seeds. These he cultivates himself. The produce is sold to the commissariat officer (under whose charge the garden is) at the rate of 2 as. a pound. The supply of vegetables from this source is considerable, and the quality is excellent.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. Dress consists of helmet or cap, coat or tunic, great coat, trousers, socks, boots, shirt, pouch, bayonet belt. Suggestions for dress, &c., see Appendix B. The dress is suitable to the climate, seasons, and duties. The wicker helmet lately introduced affords no protection. A thick, soft, light, felt helmet, well ventilated, should be substituted. A limited supply of water-proof capes for men going on guard and other duty during heavy rains would be a most useful addition to the present dress, and the committee would strongly recommend a supply of them for all regiments serving in Burmah, where it rains heavily for nearly half the year. The guard dress is in accordance with the season. Light cotton clothing is worn during the day and hot months; cloth or woollen during the wet or cold months. The men are protected on guard from rain and wet by sentry boxes, gun sheds, and verandahs.
Duties.	1. Men should be thoroughly drilled before being sent to India. 2. The usual routine of duties consists of guards, drills, and fatigues. Parades are generally in the morning, and sometimes in the evening; an hour is the usual duration. Short drills three or four times a week must be beneficial to health. The best hours for drills and parades are 6 to 7 a.m. Troops should be moved so as to arrive on the new encamping ground an hour after sunrise. There are no special orders on the subject. The average number of nights the men have in bed were, on the 1st January 1860,—Europeans, four nights a week; natives, three and a half nights. 3. There is one European guard in the town, two miles distant; all the other guards are much within this distance. The guards are relieved daily. There are roll-calls both by day and night. The number and times according to circumstances regimentally determined. Frequent night guards must necessarily be injurious to health. There should be water-proof capes or coats for guard, as already recommended.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation at this station :— *A ball court* (in the course of construction). *Several skittle grounds*, and also American bowling alleys. *Schools*, with good schoolmasters. *A garrison library*; a company library, in the Artillery; one in H. M. 68th Regiment, with a reading room. The former is not lighted, the two latter are sufficiently lighted. *Day-rooms* in the Artillery and H. M. 68th Regiment. *A soldiers' garden*, as already mentioned. *Shops* for different trades. H. M. 68th Regiment has applied for tools for a carpenters shop. *Theatres.*—One in public rooms; one in the barracks of H. M. 68th Regiment. No gymnasia. The means of recreation and instruction are considerable, but not sufficient during the wet season and during the heat of the day. In H. M. 68th Regiment the men are restricted from going out in the sun during the hot months from 11 a.m. to 4 p.m. There is no restriction on the Artillery. The restriction must necessarily be good with young soldiers fresh from England; old soldiers, such as the Artillery usually are, do not require restrictions, as experience has taught them the danger of exposure. 2. We would suggest in the way of improvement, lofty open sheds in which could be erected a gymnasium. 3. The existing savings' banks are all that are required on this point. 4. There are no means of affording shelter for the men to take exercise.

References to Subjects and Queries.	Replies.
IX. Military Prisons.	1. There is no military prison at the station. Punishments are carried out regimentally. The means are generally defective, especially in H. M. 68th Light Infantry, but there are brick and mortar cells in the Artillery lines, and also under construction in the 68th lines.
X. Field Service.	1. There are no local regulations for field service. 2. With reference to the powers of medical officers on marches, &c., there has been very little marching in this division. All movements of troops are by water. Medical officers have full power to order anything that is necessary for the comfort of the men generally. Their suggestions are always complied with, and the practical working of such power has always been found to answer. 3. As regards general sanitary arrangements, the regulations of the service are explicit, and as a general rule work well. 4. Each corps has a certain number of hospital tents, according to their strength, also doolies for natives and Europeans, and sick carts for the latter, with the power to engage any further amount of carriage on the march that may be required.
XI. Statistics of Sickness and Mortality.	No information.
XII. Hospitals.	1. Plans and sketches. 2. As regards position, the Artillery hospital is on high ground, 100 yards south-west of the nearest barrack. The 68th Light Infantry hospital is on a high plateau, 180 yards from the nearest barrack. The 23rd Regiment Native Infantry hospital is on low ground, about 150 yards north from the lines. The hospital of the 6th Regiment Native Infantry is on high ground, 100 yards south-east of the nearest barrack. The 41st Regiment Native Infantry hospital is on low ground, surrounded by buildings about 100 yards north of the lines. The two native infantry hospitals are however 40 feet above high-water mark of the river, and above any portion of the town. The ground gradually slopes from the north of cantonments to the river. The several hospitals are about two miles northward from the bazaar and town of Rangoon. The sites are open and freely ventilated, and there are no high walls, buildings, or trees, to interfere with the ventilation, except as above mentioned. The sites of the hospitals of the 23rd Light Infantry and 41st Regiment Native Infantry are low, and require drainage. 3. The water supply is not abundant during the hot season; and filters, which are absolutely necessary, are not in general use. Each hospital should have its own well. 4. The drainage is defective in every instance; the existing drains being merely trenches dug in the natural soil, without sufficient attention to slope or removal of the sewerage water to a distance. Drains of masonry are required round the building. 5. The hospitals are constructed of wood; some covered with thatch, and some with shingles. All are sufficiently raised from the ground on posts, admitting of a free perflation of air underneath the floor. There is no efficient provision for carrying away the roof water, which sinks into the subsoil. The drainage and guttering round the hospital are not sufficient to remove the rain-fall rapidly. The native hospital walls and roofs are single, and do not keep the interiors so cool as would be the case with a double roof. The European hospitals have double roofs. The roofs project, and form verandahs for shelter from the sun, but not available for exercise. The buildings are one story in height. The hospitals were built in 1853, 1854, and 1855. The following table gives the ward accommodation :—

Wards.	Regulation Number of Beds per Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area per Bed.	Height of Bed above Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
H.M.'s 68th Regiment Light Infantry.	Beds six feet apart, and two beds in each side room.	Ft. in.	Ft. in.	Ft. in.	Ft.		Ft.	Ft. in.		Ft. in.	Ft. in.
2 male wards		163 0	46 0	15 0	112,470	1,874·5	124	1 6	24	5 0	5 0
1 female ward		60 0	20 0	12 0	14,400	900	76	1 6	11	5 0	5 0
Artillery.											
1 male ward		100 5	42 5	13 0 ceiling.	59,514	1,053	126	1 4	18	4 10	4 10
5 rooms		— —	— —	— —	2,835	1,417	204	1 4	—	—	—
1 female ward		20 0	20 0	11 6	4,400	1,100	100	1 4	5	5 0	4 0
		20 0	9 6	10 0	1,800	900	90	1 4	2	5 0	4 0
1 native ward		59 5	20 0	14 5	17,255	826	59	— —	10	5 0	4 0
6th Regiment Madras Native Infantry.											
1 male ward		122 0	20 0	14 0	— —	455·6	32·6	1 10	21	4 6	4 6
23rd Regiment Madras Native Infantry.	No regulation.										
1 male ward		120 0	20 0	15 0	36,000	— —	— —	1 7	20	5 0	5 0
41st Regiment Madras Native Infantry		120 0	20 0	12 0	28,800	360 to 720	30 to 60	1 6	18	4 10	4 10

The hospital of the 68th Regiment is shut out from the south-west wind by buildings. The Artillery and 6th Regimental hospitals do not receive the advantage of the prevailing winds, as they run north and south instead of east and west. The windows open outwards,

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	and are generally considered sufficiently large and numerous. Those in the Artillery hospital are small and too high above the floor. 6. The ventilation is considered sufficient, but roof ventilation for all the hospitals would be advisable. The only ventilation at present is by windows and doors. There are no jalousies. 7. There are no means of cooling the air. 8. No means of warming are required. Till lately only the hospital of the 68th Light Infantry has been limewashed. This should be renewed once a quarter. The floorings are washed weekly. 9. The privies of the European hospitals are constructed of masonry. Those of the native regiments are of matting, which is most objectionable, as allowing the escape of noxious effluvia. The Europeans have connected covered passages; the natives none. The ordure is received into oblong boxes lined with zinc, carted away nightly, but not to a sufficient distance from cantonments, being allowed to remain on the surface and vitiate the atmosphere. Near the female hospital of the 68th regiment is a privy with a wooden seat over a cesspit, which has never been cleaned out, and is offensive. This should be altered. Although charcoal and lime are liberally used, it is difficult to keep the boxes of the privies clean. The boxes should be frequently fresh painted with coal tar. The latrine arrangements are defective. 10. The lavatory arrangements of the 68th Light Infantry appear fair. Those of the Artillery inefficient, but steps have been taken to remedy this. In neither hospital can warm or hot baths be readily commanded. Shower baths are considered essential, and one has been sanctioned for the Artillery hospital. 11. The bathing accommodation has been totally inefficient, but steps have been taken and sanction obtained for improvements in the Artillery hospital. Hitherto there has been nothing but a tub of water, without basins, soap, or towel. The 68th Regiment has been supplied to some extent, but regular baths are required. 12. The hospital linen is washed by the commissariat department. During the monsoon it is aired over large baskets by means of charcoal fires. 13. The storage is a wooden room beneath the hospital. It is damp and insufficient. A substantial masonry building is required. 14. The bedsteads are wooden cot frames, and rattan bottoms. Some are wooden planks. They have mosquito poles and curtains. The bedding consists of straw mattresses and pillows, quilted coverlid, a blanket or two if necessary, and a pair of sheets if ordered. The straw stuffing is objectionable. Iron cots with coir stuffing should be substituted. 15. The hospital kitchens are masonry buildings, furnished like all Indian cook-rooms, the utensils being of a primitive kind—chatties, frying pans, kettles. There are no boilers, spits, nor gridirons. The cooking is indifferent, and not so varied as is desirable. The cooks are ignorant of the art of cookery. A system of instruction should be established both for hospitals and barracks, and none but certified cooks employed. A cooking range would also be an improvement. 16. Hospital forms. 17. The following is the hospital establishment for a European corps of the full strength:—1 hospital serjeant, 1 writer, 1 purveyor or a cornicopoly, 1 assistant ditto, 1 cook, 1 assistant ditto, 1 cooly maistry, 3 coolies for leechings, &c., 8 ward coolies, 3 sweepers, 3 toties, 2 puckallies, 2 tailors, 2 dhobies, 1 female nurse, 1 cooly woman. With the detachment of Artillery the establishment is smaller, and with native corps it is very inefficient. The sick soldier also obtains the services of a comrade on the requisition of the surgeon. Native servants, as a rule, are very inattentive, and require great supervision, and Europeans are averse to be waited on by them. 18. The sanitary condition of the hospitals has on the whole been good, notwithstanding the drawbacks mentioned. There are no records of hospital gangrene or pyæmia. 19. The following improvements in the hospitals are suggested by the medical officers, and in which the special committee fully concur. Greater comfort in serving up meals; at present tin vessels are used for all purposes; the same tin pot serving as a tea cup, a soup bowl, and drinking cup. Crockery and glass should be substituted for Europeans, with cutlery, which at present the patients bring with them from the barracks. A meat ration is decidedly necessary for natives. 20. The convalescents of European regiments take exercise morning and evening in small carts or doolies, if necessary; they usually resort to the public gardens, which are in close proximity to the European hospitals. Regimental exercising grounds are unnecessary. The public gardens require enlargement and improvement. 21. There are separate detached wards for females and children, and the general arrangements are satisfactory. 22. There are no local hospital regulations. 23. As regards the powers of medical officers, they have no controlling power. The medical officer can only represent, which may be approved of or otherwise by the authorities; but his representations are generally attended to. In the matter of diet there is no difficulty, as the superintending surgeon generally sanctions any extra diet or comfort for which valid reasons can be given. It is desirable, however, that mutton should be available when required. 24. There are no convalescent wards. The medical officer considers that a convalescent hospital might be established with advantage near the mouth of the river. A hulk might be preferable for this purpose.
XIII. BURIAL OF THE DEAD.	1. The British burial ground is about 800 yards from the station. The wind blows in that direction for only a short time during the cold weather. 2. Its area is 22,755 square feet. Soil sandy; drainage, except in the low corner, good. Decomposition is believed to take place readily. The ground is tolerably kept. 3. The grave space is sufficient; graves are 3 or 4 feet apart. Depth 6 feet, width 7 feet. Only one body interred. Graves never re-opened. The time of interment is dependent on circumstances, and never beyond 24 hours after death. Hindoos burn their dead. Mussulmans and others bury theirs. Their burial ground is at a considerable distance from cantonments. Burial or burning takes place a few hours after death. The following is the order on this subject:—"The funerals of deceased soldiers are to take place at sunrise, or at half an hour before sunset, according to circumstances.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	The corpse is on no account to be carried into church previous to interment." There is also an order for preserving the ground in proper order. 4. The burial ground is not offensive. 5. The dead of the bazaar people are disposed of in the same manner as those of the native troops. 6, 7. No injury to health accrues from the present practice, and no improvements are required.

(Signed) concurrently,
Jas. Bell, Major General, Commanding Rangoon and Pegu Division.
E. S. Tribe, Surgeon and Sanitary Officer.
Rangoon, 6th June 1860. Edward Leeds, Captain and Executive Engineer.

Answers principally filled up from information obtained by a special committee.
President—Colonel Croggan, Madras Artillery.
Members { Lieut.-Col. M'Gown, 6th Regiment Madras Native Infantry.
Lieut.-Col. Greer, Her Majesty's 68th Light Infantry.
Major Haly, 41st Regiment Madras Native Infantry.
Major Tapp, 23rd Regiment Light Infantry.
Brigade Office, Rangoon.

APPENDIX A.

Climate of Pegu.

Replies to Queries on Climate addressed by Colonel Croggan, Artillery, President Special Committee.

Meteorological Instruments.	1. Thermometers, barometers, and hygrometers.
Meteorological Observations.	2. Only acquainted with the climate for three years, and have no adequate observations at command.
Climate; Dryness, Moisture, &c. &c.	3. Rain prevails throughout Pegu, though in varying quantities, from May to October, inclusive. Average fall, probably 80 inches. During the remaining six months, there are for about two-thirds heavy dews generally, and frequently morning mists. Towards the close of this period the air becomes very dry, the wet bulb being probably twenty degrees below the other; and a faint approach is made to the hot wind common at this season on the continent of India. A favourable characteristic of this season is the rapidity with which the thermometer falls about sunset. In the coldest season the variability of temperature is marked; in some parts, as at Rangoon, the thermometer, which stands below 60° at sunrise, will rise to 90° by 2 p.m. The actual heat does not appear excessive for a tropical region. Rarely does a thermometer exposed on the northern aspect of a house under the shelter of an open verandah rise above 96°. The thermometer so placed probably rarely falls below 54° in any part of the Pegu province. As for tree-planting, the whole country is nearly a pathless jungle. Canal irrigation, there is none, but two-thirds of the province being the delta of the Irrawaddy, there are abundance of streams, and rice is the staple production of the country. There appears to me no admixture of dust or other noxious matter sufficient to vitiate the atmosphere to any sensible degree.
Healthfulness.	4. Medical returns support the general opinion that for Europeans Pegu is a very healthy country. The porosity of the soil generally is remarkable; and, speaking generally, disease of malarious origin is far from rife in Pegu.
Clothing suitable.	5. Owing to the dampness of the climate for half the year, and its variability for a moiety of the remainder, light woollen clothing may be considered most conducive to health for nine months of the year for outer clothing, and as regards the inmost garment recommendable throughout the year. As regards diet and shelter, I know no special requirements. As regards military exercises, I much deprecate evening drill. Daylight closes in early. The sudden fall of temperature which takes place about sunset has been already noted, whilst two hours before that period the diminution has scarcely begun. The soldier of necessity becomes much heated at parade, and immediately it is over is pretty sure to throw off the greater part of his clothing. These evening drills, in my opinion so objectionable, are chiefly found in the commands of officers recently arrived in India, and as yet unaccustomed to very early rising.
Military Exercises. Evening parades objectionable.	
Comparative Healthfulness of different months.	6. The healthiest months are from February to May, inclusive. The most unhealthy months are June, when the rains are in their first burst, and September and October, when they have reached their maximum, and drying up begins. This limited unhealthy season applies only to Europeans. As regards natives, from their susceptibility, the period from November to the middle of January has to be included therein.
Disease, when most prevalent, and of what character.	7. Among Europeans bowel complaints are the especial product of the wet or unhealthy season. There is also some increase of fever and of unhealthfulness generally; but, as inductive of disease, different seasons are much more strongly marked in the native army, among which, at the close of the rains, and throughout the cold season, fever becomes epidemic, though to a much less extent than in many parts of India at the same period.
No Sanitaria known in vicinity.	8. Rangoon being the lowest point of the delta of the Irrawaddy, it is not likely there is any adjacent district the climate of which, from superior elevation, is more conducive to health; neither have I heard of any so deemed, from the above or for any other reason.
Salem, Madras, Vellore, Trichinopoly, French Rocks, Secunderabad, Kamptee, Jaulnah, Saugor.	9. The stations I have served at previous to coming to Pegu are given in the margin. Salem, as lying in a valley rife with malarious disease, may perhaps, *per se*, be deemed "positively injurious;" but a great abatement thereto is made by the immediate vicinity of the Shevaroy hills, rising from 3,000 to 5,000 feet above the sea; and certainly, for nine or ten months of the year, perfectly healthy. The three next named are probably of equal, and, for Southern India, of average salubrity. In this last respect the same may be said of all the remaining stations. All are on table land of more or less elevation, Saugor being the greatest, and

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References to Subjects and Queries.	REPLIES.
	except the French Rocks and Saugor, not far removed from the same latitude—Saugor on the verge of the tropics, being at once the most northerly and the most elevated, and the French Rocks the most southerly station. Europeans are subject to severe fever and bowel complaints in all these stations; but these may yet be deemed "conducive to health" in this country, so far as the greater intensity of the cold season tends that way in the European; and, judged by the average standard of health in India, none can be deemed "positively injurious."

Superintending Surgeon's Office, Rangoon,
27th March 1860.

H. GRAHAM,
Superintending Surgeon.

APPENDIX B.

SUGGESTIONS for the DRESS, CAMP MANAGEMENT, &c. of the ARMY IN INDIA, by MAJOR G. T. HALY, of the MADRAS ARMY.

SECTION I.—HEAD DRESS.

"Puggeree" (cloth) round the Cap most objectionable.

THIS most important article of dress should be light and well ventilated; the plan too often adopted of wearing a "puggeree" (cloth) round the cap is most objectionable, as entailing extra weight, besides engendering heat.

Ventilation and Lightness are the great Desiderata.—Every extra Ounce tells on the Man with killing effect.

The argument advanced that it is worn by the natives is fallacious. Firstly, the native, from his youth upwards, has been accustomed to it and to the climate; secondly, the native only wears a muslin or light cloth turban, invariably either loosely put on or open at the top, and not over an air-tight cap, which makes all the difference.

Description of Helmet.

In the "field service helmet" proposed, and already submitted by me, lightness with ventilation has been the principal aim, as the following description will exemplify, viz.:

Neutral Colour.

Soft thick felt, ventilated by an air tube on the crown, communicating with a broad air-chamber running round the head over the temples, with a false inner band or headpiece to fit the head; the vacuum* thereby caused giving further ventilation, and preventing the direct action of the sun on the head.

SECTION II.—WOOLLEN COAT.

Ventilation and Protection from Heat. White is objectionable, causes a painful Glare, and is too conspicuous.

A loosely-fitting tunic of a neutral colour, with strong pockets from side-seam to front as haversacks, open at the arm-pits for ventilation and to admit of closing by lacing; the back of the tunic to be padded between the shoulders with a loosely-spun felt (or numda cloth) as a protection to the spinal marrow.

SECTION III.—TROUSERS.

Pattern as worn by Sailors.

Trousers strong and loosely made, of the same colour as the tunic, to fit without braces (sailor pattern), braces being highly objectionable, as interfering much with free action, as well as causing heat and adding weight.

SECTION IV.—SHIRTS AND FLANNELS.

Calico and coloured Flannels and ditto Bands.

Strong calico, with the collar fitting loosely round the neck, and a couple of coloured flannel ditto when on actual field service. A flannel waistcoat should be invariably worn next the skin with cotton shirts, as well as flannel drawers in the cold seasons, and worsted socks on all occasions of work, as well as flannel bands.

SECTION V.—NECK-TIES.

Square Silk most useful.—Cotton Handkerchief most refreshing when wetted.

A square black silk neck-tie, to tie in a bow, and go once or twice round the neck, according to the season. A kerchief, besides being cooler or warmer according to pleasure, will be found much more useful in many other ways than a stock; and no soldier should be without a handkerchief, which, besides its many other uses, will be found most refreshing wetted and placed on the head in the hot season, or loosely in the helmet on the line of march, &c., and many a *coup-de-soleil* has been thus prevented.

SECTION VI.—SHOES.

Brown Leather, with Brass or Copper Sparables, lasts longer and is easier to the Foot.—Sambre-skin worn by all Sportsmen.

Ammunition ankle-boots, of brown leather (the black attracting the sun), and a composition of wax, lard, resin, and camphor, will make them water-tight, and preserve and soften the leather. The soles and heels should be studded with brass or copper sparables, the iron ones rusting and eating away the leather and stitching even of new ones during the monsoon. A very good and cheap description of boot for the dry season can be made up in India of sambre (elk) skin; the leather is so soft and pliable as to obviate the necessity of wearing socks. They are well known, and worn by all sportsmen, racket, and cricket players in India.

SECTION VII.—GREAT COATS.

Too heavy and soak the Rain, and thereby cause Sickness.—Weight is as damaging to the Soldier as to the Race Horse.

The present thick woollen great coat is much too heavy for general use in India; a lighter one should therefore be substituted, made of some material that will throw off the rain, and not, as with the present one, soak it in, and thereby not only double its weight but likewise cause much illness, owing to their being worn and slept in when in a wet state, for when once saturated they take hours to dry.*

SECTION VIII.—BEDSTEADS.

Sleeping on the Ground most injurious.

Few things are more injurious to health than sleeping on the ground, particularly during and for some time succeeding the rains; and though it would be impossible to carry cots for an army in the field, yet much can be done in the way of a substitute by raising sleeping places by means of brushwood, straw, &c., and tarpaulins should be laid down in the tents.†

Saving to State.

These can always be carried, and would be found most useful as a covering or protection for the baggage, &c., &c. on the line of march, but on the regular line of route there should be cots kept or raised platforms erected. This great comfort for the men, with certain beneficial results to health, and thereby incalculable saving to the State, can be readily obtained at a mere trifling expense.

SECTION IX.—TENTS.

Ventilation and Punkahs required.

The tent furnished for the European soldier in Indin is perhaps the best in the world, requiring simply ventilation above, on the principle adopted in the present home ordnance tent; and no time should be lost in calling the attention of the authorities in India to this valuable improvement. Punkahs, likewise, would have a most beneficial effect, as the agitation of the air caused by them would effect the double object of cooling the men and causing a free ventilation; further, they would induce the men to keep more in the tents during the heat of the day

* In this vacuum a light wadding is placed but so as not to interfere with the ventilation, for this is the grand secret of a solar head dress.

* I have since invented a cloak which opens out into a blanket, and can be converted into a tent.

† Mosquito curtains are thought by the Chinese indispensable t health; and I believe them to be so in that country.

and at night—most essential objects to be gained, but difficult to obtain, owing to the discomfort of the heated atmosphere of an ill-ventilated and crowded tent.

Section X.—Camp and Encamping Ground,

Elevated, dry, open Position to windward of Town to be selected.

The most open, dry, and elevated spot should be selected for encamping; to windward, and as distant as practicable from the town or village, as well as from any swamp or marshy ground. The practice of encamping, even in the dry season, in paddy (rice) fields is most objectionable, and should be strictly prohibited.

Cleanliness essential.—Impurities to be destroyed by Fire.—Unhealthy Tracts to be passed between Sunrise and Sunset.

Care should be taken to burn all impurities in the vicinity of the camp for even a day's halt; but for a standing camp cleanliness becomes still more essential, and, therefore, in one even of the shortest duration the strictest attention should be given to this important point, and all rank grass or jungle in the vicinity should be destroyed by fire, cutting it and allowing it to lay having a pernicious effect; and in case of any epidemic in a jungle country, fire should be kept burning night and day to windward of the camp. All suspected and unhealthy tracts shall be passed during the day, if practicable.

Section XI.—Water.

Wells to be dug, with other Measures for purifying the Water.—Purifying Effects of Charcoal on Water.—Charcoal and Water Bags.

The necessity for having this necessary of life pure and wholesome is well admitted in all countries, and the natives of India, with some justice, perhaps, attribute most sickness to impure and unwholesome water;* and as filters cannot be carried for a whole army small wells should be dug—two or three feet deep will suffice—in the beds of rivers and vicinity of tanks (ponds). A few baskets of charcoal (always procurable), thrown in at the bottom, and kept down by covering it with sand or clay, will ensure filtration, with a certain degree of purification. Boiling it has likewise a beneficial effect, but not so easily accomplished for bodies of men. Bags of charcoal should likewise be kept in the camp; "puckalie (water) bags," as well as the small ones to contain about two quarts of water with which every man ought to be provided.

Simple Filterers in common use in India.—Earthen Pots.

In standing camps, cantonments, or garrisons, there is a most simple and efficacious mode of forming filterers; one in common practice in all gentlemen's houses throughout India, viz., by placing three chatties (earthen pots) one over the other, the bottom one simply to catch the water, the other two having small holes drilled through the bottom, the centre one three-fourths filled with a mixture of sand and charcoal, the upper one as a reservoir for the water, from which it drops through straws placed in the holes to regulate the dripping; but they are too commonly in use in India to need further description.

Section XII.—Diet.

Exposure on empty Stomachs injurious.—Hot Coffee or other warm Beverage advisable first thing in the Morning.—Spirits, unripe Fruits, &c., prejudicial.

The practice of marching and exposing the men with empty stomachs to the malarious effects of the chilly vapours before dawn is most injurious, the system being then more prone to disease. Hot coffee or other warm beverage with a biscuit or slice of bread should, therefore, be provided and taken by the men ere quitting their tents or barracks. Too much care cannot be taken to prevent the men drinking toddy, eating unripe fruit, or crude vegetables. Drinking spirituous liquors should be discouraged as much as possible, and never served as a ration, or from the canteen, in a raw state; the best preventive against this is to facilitate the procuring of malt liquors.

Meat Rations generally too much.—Vegetables and Fruit occasionally to be substituted.

The present meat ration is well suited for field or hard work, but is by far too much for the idle life led in garrisons. Vegetables and fruit, in lieu of a full ration of meat, would, there is no doubt, at times be conducive to health, and such is the opinion of most medical men, who ought to be empowered to regulate such matters.

* The water up the Yang-tse-Kiang was about the colour and consistency of pea-soup; drank in this state, it must have been most unwholesome; and to this I attribute much of our illness up that river, as it contained much decayed vegetable matter, a large deposit of which was obtained after standing a few hours.

Section XIII.—Exercise and Cleanliness.

Exercise in Open Air.

Exercise is most essential, and the men should be sent out morning and evening to walk in *small* parties, under a non-commissioned officer, if thought necessary. But the practice of marching them out in a body, particularly in the hot weather, is both distressing and injurious to health, owing to the clouds of dust raised, and the quantity of it that thereby must be inhaled.

Swimming and Gymnastics.—Swimming Baths.

Swimming and gymnastics of all descriptions should be encouraged; cleanliness of body and clothing is most essential to health; and bathing, at least once a day, should form part of the day's routine in the field. There should be a swimming bath attached to every European barrack for the same purpose.

Section XIV.—Miscellany.

Clasp Knife, with Needle.—Cords for drawing Water.

Every man should carry a clasp knife, with a needle (made on purpose), for mending clothes, shoes, &c., and a small semicircular tin pannikin (made to stand the fire), with a small cord twelve yards long attached to draw water with. This cord would be found most useful in many ways, forming escalading ladders, &c., and can be carried in a hank in the pannikin. The necessity for these is admitted in the native army, forming a portion of the kit of the sepoy, under the denomination of "jumboo and rope."

In the field, great coats should invariably be put and kept on when heated after a march or work of any kind.

Board Ship.*—A few Remarks on Cleanliness and Exercise.

Previous Training required.—Supervision of Officers most necessary.

Shipboard duties and discipline should form part of the training of the army, and ought to be as regularly practised on shore at parades for the purpose as any of the other duties, particularly tying knots, lashing, unlashing, slinging hammocks, &c. There is no situation in which a soldier is placed requiring more foreknowledge both in officers and men, nor one in which the personal care and supervision of the officer is more immediately necessary, or requiring stricter attention to carry out regulations.

Difficulty of Insuring Cleanliness and Exercise.

The difficulty of insuring cleanliness and exercise to troops on board ship is well known to all, yet both can be secured with care and attention to a system adopted by me while in command of troops during two long voyages (each over three months) between India and China.

Mode of Bathing.—Bathing Parade.

The men were paraded every morning (weather permitting), in bathing drawers, when the following order of parade was gone through:—"Prepare for bathing"—both ranks immediately sat or squatted down, the front rank leaning a little forward, men detailed for the purpose passing along in front with buckets of water, *douching* each man as they proceeded, the rear-rank men scrubbing the backs of their fore-rank men, each front-rank men washing the fore-part of his body at the same time. This continues for fifteen minutes, the command "Stand up" was then given to ease their limbs; "Right-about" was given, and the same order of washing was gone through with the rear rank.

This mode not only ensured cleanliness of person, but a certain degree of healthy friction for the body, with more exercise than may at first be supposed.

Washing Decks; good Feeling thereby obtained between Soldier and Sailor.—Watches kept to their Work, with other Modes of obtaining Exercise.—Drill, &c.; with Ball Firing.—Suffering of Troops in China from want of Exercise.

The decks (with the exception of the forecastle) should always be washed by the soldiers, both with a view to pro-

* The whole of this system was fully carried out by me with the greatest success during my late voyage with recruits from England.

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mote a good feeling between the soldier and sailor (for nothing is more disliked by sailors than to clean for the soldier), and dry holystoning between decks was likewise frequently practised both as an exercise and keeping the decks sweet and clean without damp. The other methods of obtaining exercise are more numerous than may be supposed, for instance, the watches were kept, not nominally, as every man was kept at his post and alert at his duties, trimming sail, &c., and not, as is too often the case, sleeping through his watch. But beside the regular duties of the ship, the men off duty daily had some work that enforced a certain degree of exercise, such as drawing the water for bathing, washing decks, and for other ship uses; manual and platoon exercise was, weather permitting, daily gone through, including aiming practice, with ball practice once a week; marching, likewise, was performed by passing along and round the decks, with counter-marching by files, and this, by placing lines for the purpose of steadying the men, could be gone through even in rough weather, and for a long voyage nothing is more essential than constant exercise, both as regards the immediate as well as after health of the men; and the want of exercise on the voyage out was one of the causes assigned for the unhealthy state of the troops in China during the expedition of 1842 and 1843.

All European Soldiers shall be trained as Artillerymen.

With a warfare such as is now going on in India, it becomes most essential that every European soldier should be a trained artilleryman, accustomed to move and handle heavy ordnance, which practice could be fully carried out during the voyage, and at the same time give full and manly exercise.

Sleeping between Decks in a crowded and heated Atmosphere to be avoided.—Sleeping on Deck under an Awning to be enforced.

Contrary to the instructions laid down in Her Majesty's Regulations, page 316, par. 41, my experience has shown that much disease is engendered by sleeping below in warm weather, in a crowded and overheated atmosphere, and that sleeping on deck (under an awning) should not only be encouraged but enforced during the warm weather and calms, to the extent of at least half the numbers.

APPENDIX C.

MADRAS ARTILLERY.—HOSPITALS.

References to Subjects and Queries.	REPLIES.
HOSPITALS.	The hospital is situated on the south-western side of a quadrangular area forming the Artillery lines, and which area occupies the north-eastern angle of cantonment.
2. Position of Hospital, &c.	(1.) It (the hospital) lies to the westward of the barrack buildings, distant about 100 yards from the nearest, and about 290 yards from the stables. (2.) It lies about two miles to the northward of the bazaars, and of the houses of the civil population generally, that is, of the *town* of Rangoon. (3.) The site is open and freely ventilated, and there are no buildings, high walls, or trees, which interfere with ventilation. (4.) The site itself, as relates to elevation, capability of drainage, absence of malaria from river banks, marshes, nullahs, and ditches, is good; but water-pits and "foul grounds" exist within the area of the regimental lines, though not perhaps within that of the hospital, the limits of which, however, are not well defined by any fence or enclosure.
3. Water supply.	The water supply is *not* abundant. No water is obtainable within the hospital limits; all has to be brought from a well in the lines of the 6th Regiment. The water itself is wholesome, but at the present season is liable to become turbid from the wells failing. A well should be dug within the hospital compound.
4. Drainage.	No drainage, but a simple ditch round each building, exists. These ditches are constantly becoming obstructed by the banks falling in. The refuse water is led off by a similar channel to low ground, some 20 yards to the south-west of the hospitals, where it sinks into the soil.
5. General structure and arrangement of hospital buildings.	(1.) The ward of each of the hospitals, European (male and female) and native, are raised eight feet from the ground, and there is a free perflation of air underneath the floors. (2.) No provision is made for carrying away the roof water, except by the ditches already mentioned; much of it sinks into the subsoil. (3.) The surface drainage and guttering round the hospital has been already described, and is *not* sufficient to carry off rapidly and effectively the rain-fall.
Materials of which the hospital is built, &c.	(4.) The hospitals are built entirely of wood, with thatched roofs; the walls of none are double. The roof of the male European ward may be said to be double, as it has an interior lining (roofing) of plank; this ceiling, however, has not a single ventilating aperture. The arrangement of roof just described (with the addition of ventilating apertures) will suffice I think to keep the ward as cool as can be expected. The native ward and the female ward do not possess this advantage.
Existence of verandahs.	(5.) No covered, boarded verandahs available for exercise exist. Nothing but a space equivalent to the overhang of the roof exists all round the hospital, which has a breadth of 7½ feet, but is not available for convalescent exercise in wet weather, though affording sufficient shelter to the building from the sun's rays.
Number of flats of which Hospital consists.	(6.) The hospitals consist of only one flat, divided into one ward for the general sick and side rooms for dispensary.
Arrangement and construction of windows, &c.	(7.) The male hospital is not placed so as to derive full benefit from prevailing winds. Its long axis is from north to south. It would have been better to have built it extending from east to west; the native hospital is thus built. The windows open outwards, and are glazed; and the only fault I find with them is that they are small, and should extend nearer to the floor. The slope and projection of roof beyond them is such, that sufficient light and air does not enter.
6. Means of ventilation.	No means of ventilation but by doors and windows exist. With the small number of sick usually accommodated, the wards can at all times be kept free from odour or closeness; but if they were called upon to accommodate the full number for which they are supposed to offer accommodation, I do not think the air could be kept pure.
Jalousies and jhilmils.	There are none in either hospital.
7. Artificial means of cooling the air.	No artificial means are in use.
8. Artificial means of warming.	None in use.

References to Subjects and Queries.	Replies.
Cleansing and limewashing wards. 9.	The wards are washed and cleansed once a week. They have not hitherto been limewashed, but I have taken steps to ensure its being done, as I consider it essential to health.
Privies, water-closets, urinals.	No water-closets exist. The privies for Europeans and natives are under the same roof, divided by a partition, and are situated about 15 yards from the hospital. The "urinals" consist of a urine tub standing in the privy.
Drainage, water supply, &c., of privies.	The drainage is indifferent, indeed there is no drainage properly so called, for shallow trenches in the soil cannot be called drains. The privies are not placed over cesspits, and are often offensive. The ordure is received into wooden boxes lined with zinc, which are removed and emptied each night. It is difficult to keep them clean and free from odour, though charcoal and lime are liberally used. They might be kept sweeter by being constantly fresh painted with coal tar.
10 and 11. Lavatory arrangements, and bathing for the sick.	The lavatory arrangements may easily be described. They consist of a large tub of water standing in the centre of a damp floor of a room beneath the hospital, without basins, towels, or soap. They are not only not sufficient for the sick, but positively hurtful to them. A lavatory furnished with basins, soap, towels, a shower bath, with conveniences for a hot or warm bath at any moment, ought to exist on the same flat with the wards.
12. Washing and drying hospital linen, &c.	This does not come under my cognizance, the linen is washed by the commissariat department, by contract.
13. Whether the storage is sufficient and dry.	The storage is in a small room on the ground floor, that is, beneath the hospital, and cannot be dry in the wet weather, neither can be considered sufficient or good.
14. Bedsteads and bedding in use.	The bedsteads and cots are of wood, with rattan bottoms, and furnished with poles and mosquito curtains. The bedding consists of mattresses and pillows stuffed with straw, a pailliass or quilted coverlid, a quilt, a blanket, or two if necessary, and a pair of sheets for each cot, when considered necessary. The only improvement which suggests itself to my mind is, the substitution of coir for straw in the mattresses and pillows.
15. Hospital kitchen, cooking, &c.	The kitchen is situated 15 yards to the westward of the hospitals, and is as well furnished as cookrooms in India usually are. Some additional cooking implements might be furnished with advantage. The diets are fairly cooked, and can be sufficiently varied. There is room, however, for great improvement in cooking, and great benefit would be conferred upon the sick, if some rules for plain hospital cooking were drawn up and printed in Tamil for the use of the cooks who should be proved to be well instructed in such duties before being entertained.
16. Diet table, diet roll, statistical forms of sickness, &c., &c.	Forms transmitted.
17. Attendance upon the sick.	The hospital establishment consists of one hospital serjeant and one hospital orderly (European); but the services of the comrades of any European sick are obtained on application :— Besides these individuals, there are the following native attendants attached to the hospital :— 1 cornicopoly in charge of clothing and diet. 5 ward coolies, for attendance on the sick. 1 leech man. 2 surgery coolies. 2 bheesties or water drawers. 3 toties. This attendance suffices for the number of sick usually under treatment. The native soldier also has the services of a comrade as an attendant in all cases requiring it.
18. General sanitary condition of hospital.	A nurse is entertained in the female ward. The sanitary condition of the hospital has apparently been fair since its erection, and I can find no record of epidemic disease, hospital gangrene, or pyæmia, having appeared in the wards.
19. Sanitary defects.	Some of these have been already touched upon, and consist of inefficient drainage, insufficient water supply, and the absence of any comfort or convenience for ablution. I would add, also, the absence of comfort in the arrangement of meals for the sick and convalescents. They have to eat off *tin* dishes and drink out of *tin* pots. The improvements necessary are— 1st. A system of pucka drains leading all refuse water and sewage to some distance from the hospital. 2nd. The excavation of a well for the use of the hospital itself. 3rd. The erection of a dead-house away from the hospital. At present it is beneath the building—a highly objectionable arrangement. 4th. A well furnished lavatory, with basins, towels, soap, and a shower bath on the same level as the wards. 5th. The substitution of vessels of earthenware for messing for the tin ones now used. 6th. The whitewashing of the interior of the hospitals, and the addition of a boarded roof or ceiling to the native and female wards. 7th. The introduction of a few plain rules for plain cooking.
20. Provision for exercise for convalescents.	There is no provision for convalescent exercise. The only place available is the space below the hospital, but that must be damp in the wet weather. Hitherto the convalescents have not been allowed the advantages which are at their disposal. I have lately applied for a sick-cart to convey them to the public gardens of an evening, which gardens, being so near to the Artillery lines, afford a pleasant lounge for this class of patients, rendering any *special* convalescent exercising ground scarcely necessary.
21. Provision for treatment of wives and children.	The wives and children of soldiers are admitted when necessary into a ward or detached building set apart for the purpose. Trifling cases are treated as out patients, and medical aid is now afforded them at their own quarters, or in the patchery in special cases. These arrangements are, I think, good and satisfactory.
22. Special local regulations.	I am not aware of the existence of any.

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References to Subjects and Queries.	REPLIES.
23. Powers practically vested in medical officers.	Practically, no powers are ceded to the medical officer in questions of this kind; he can only *represent*. His indents upon departments for supply or repair, &c., must be countersigned by the officer commanding his regiment, or by the superintending surgeon; and owing to this, inconvenient and hurtful delay is often experienced in carrying out any necessary sanitary measures. Indeed, even when the representations are admitted and supported by commanding officers, delays occur in higher quarters detrimental to the welfare of the sick. The medical officer, whether he be regimental or garrison, although held responsible for the sanitary condition of his regiment or of the cantonment, as the case may be, has virtually no power to enforce a single suggestion, or carry out a single measure of sanitary reform. In the matter of diet and medical comforts there is no difficulty. The superintending surgeon's sanction is always given to any diet or comfort for which any valid grounds can be shown; and in his absence from the station, the regimental surgeon can order anything he likes, furnishing at the end of the month a memorandum explanatory of any unusual or excessive expenditure.
24. Convalescent wards or hospital.	No convalescent ward exists in the hospital of which I have medical charge, and no convalescent *hospital* for the *station*. The latter would be of great advantage to the sick, and I conceive that the organization of a well found hospital ship to be stationed at the mouth of the river, say off Elephant Point, and to which convalescents, or sick not convalescing favourably in hospitals on shore, could be sent, would be found to answer admirably, by shortening the period of convalescence and by saving many valuable lives. Date of construction not known. Total number of wards. { 1 Male, with 2 small side rooms for special cases. 1 Female, with one verandah room for ditto. 1 Native. Total regulation number of beds.—No regulation on the subject.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Mean Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in feet per Bed.	Height of Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
		ft. in.	ft. in.	ft. in.	ft.			ft. in.		ft. in.	ft. in.	
Male ward - - -	No regulations to be found on this subject. Beds 6 feet apart; rarely more than 10 patients; could accommodate say 36 patients and 2 in each side room.	109 5	42 6	13 6	59,514	1,053	126	1 4	18	4 10	4 10	Besides this there are 6 doors, each 7′ 10″ × 4′ 10″.
Do. side rooms, each		17 6	12 0	—	2,835	1,417	204					
Female ward, centre room		20 0	20 0	11 6	4,400	1,100*	100	1 4	5	5 0	4 0	2 doors.
Do. side room -		20 0	9 6	10 0	1,800	900†	90	1 4	2	4 11 / 3 0	4 0 / 2 11	1 door, 6′ 2″ × 3′ 5″.
Native ward - -		59 6	20 0	14 6	16,520	826‡	59	No cots in use.	10	4 11	3 11	6 doors, 6′ 11″ × 8′ 11″.

N.B.—In calculating cubic contents, &c. fractional parts of a foot are omitted.

* Allowing 4 beds, which is as many as the ward can accommodate, with due reference to purity of atmosphere.
† Allowing 2 beds.
‡ Allowing 10 beds each side.

Rangoon, 12th March 1860.

(Signed) J. L. RANKING, Surgeon in Medical Charge, Artillery, Rangoon.

APPENDIX D.

HOSPITAL OF HER MAJESTY'S 68TH REGIMENT LIGHT INFANTRY.

HOSPITALS.

1, 2. The 68th regimental hospital is situated near the southern extremity of the sort of irregular plateau formed by the gradual rise of the ground from the Rangoon river from the east and south, towards the Shoay Dagon Pagoda.

1st. It is to the south of the barracks, and distant about 180 yards from their nearest bungalow.

2nd. It is to the eastward of the regimental bazaar, and distant about 400 yards, while it has the sudder bazaar and the civil population of Rangoon and Pusondoung to the south, at distances varying from half a mile to two miles. On the west, about a mile and a half off, is the village of Kemendine. There are besides in the immediate neighbourhood the huts and sheds of squatters and followers, comprising the lowest and dirtiest class of natives, as dhobies, toties, sweepers, &c.; as, for example, about Dhoby's tank, on the south-east, the huts between Lake road and the barrack site, and those located round and about the Shoay Dagon Pagoda, commissariat cattle lines, &c.

3rd. The site might be said to be good, and nearly as well chosen for the purpose as the nature of the ground allows, but that the three buildings which compose the native detail hospital and division medical stores, erected close to its southern extremity, effectually keep off the sea breeze from that quarter.

4th. The site, if another hospital was thought of, might be better selected, although its elevated position, being nearly as high as the barracks, affords facility for natural drainage. All the low ground immediately around the hospital site, including as it does at greater or lesser distances within its area marshy land, imperfectly made nullahs and drains, together with native dwellings in a noisome condition and not subject to a sanitary police surveillance, these and other nuisances, as the habits of native regiments with regard to latrines, and last, not

References to Subjects and Queries.	Replies.
Hospitals—*cont.*	least, the close proximity of a hospital for native details to windward, all tend to render the site a dangerous one, under existing circumstances, from without. 3. The supply of water to the hospital is sufficient, and is of good quality: but for drinking purposes it would be better if filtered. There are no filters. 4. Shallow open cuttings are made around the hospital buildings in a line with the projecting roof, and these, with a few similar cross-cuttings to meet, take the direction of the cook-houses, which they pass by towards the ravine on the east of the buildings. During the monsoon these open cuttings are flushed with the rain water, which carries with it down the slope the refuse water from the cook-houses, &c. During the six months of dry weather there is no provision made for carrying off the refuse water. 5. There are three buildings used for the treatment of the sick; viz., two large bungalows, of equal size, and one of smaller size, which has been painted green, and is the ophthalmic ward. The two large bungalows are superior in construction; they have a double roof, *i. e.*, an inner ceiling of teak boards, and an ordinary leaf and bamboo roof externally, and with an interval of some 3 feet between it and the inner ceiling. 1st. The height of the ward floors from the ground in each building averages 6 feet, and there is a free perflation of air underneath them. 2nd. The only provision made for carrying away the roof water is that already described when speaking of the refuse water. No doubt a great portion of the rain and roof water finds its way into the subsoil. 3rd. I have nothing further to add regarding the surface drainage, in addition to what has already been said regarding the shallow cuttings; no doubt the provision is not sufficient, although it carries away much of the rain-fall. 4th. The hospital bungalows are raised on pillars of teak wood, some 6 feet from the ground; the sides or walls are of teak planks, $\frac{3}{4}$ inch thick; the roof, as above stated, is double, but the sides are not double-planked; the double roof permits of good ventilation, and if the walls were double-planked it would be a great improvement; the floor is of teak planking, set on in the rough, *i. e.*, without much planeing or close approximation of the adjacent boards; hence there is free ingress for the cool air upwards through the floor, which is single. 5th. The external or Palmyra leaf roof projects downwards and outwards all round the bungalow for some 10 feet, thus forming a verandah on every side, the floor of which is the *ground*. Convalescents can avail themselves of the shelter thus afforded, and seats are provided here and there for their convenience; the hospital sentry makes his rounds also beneath this verandah roof. 6th. There is but one flat. 7th. The hospital is shut out from the south-west monsoon by the three buildings already referred to. The windows open like a glass door on hinges, and towards the outside; they are large enough and numerous enough. 6. Large openings in and along the apex of the inner ceiling in the large bungalows communicate with the external atmosphere, through the interval left between it and the outside roof; a draught is thus indirectly kept up, which facilitates the removal of the lighter air; the numerous openings, also, by means of doors and windows on every side of the building, besides the many open chinks in the floors, render the natural ventilation of the wards very fair, and keeps them, with proper attention to cleanliness, &c., pure and sweet within. There are no jalousies in any of the buildings. 7. Except it be punkahs, there are no artificial means employed for cooling the air admitted into the wards. 8. There are no artificial means for warming the air admitted into wards employed. The walls and ceilings of the wards were thoroughly cleansed and limewashed some five months back; it was then done on the requisition of the surgeon, myself, and doubtless would be so done whenever required. 9. There is one brick-built privy in the centre and eastward of the two large bungalows; it contains a wooden seat, opening over portable wooden boxes lined with zinc, and which receive the soil. These boxes are carted away and cleansed with water and quicklime daily; the boxes are inserted through a sort of trap door in the posterior or eastern wall of the privy, and likewise removed. There is another privy within the hospital enclosure, which belongs specially to the ophthalmic bungalow; it is also to the eastward of the building, and only a little way removed from it, like its fellow of the large bungalows, and, unlike it, built of wood; it contains a wooden seat, with holes, over a cesspit or hole dug in the ground, which hole receives and has received the excreta since it was originally built; it has not been cleaned out, and the smell is offensive. The plan should be altered. 10. Wash-houses built of wood, and raised some 3 feet from the ground, sufficiently supplied with water, tubs, tin basins, soap, and latterly, towels, are within easy access of the large bungalows; one to each. Within the wards a corner room is set apart for the convenience of such sick as cannot with propriety use the wash-house below. But a regular bath-room properly furnished and supplied at pleasure with hot and cold water is an essential to the efficient working of a hospital. A shower bath, too, is not only a desideratum, but an indispensable means of treating certain classes of complaints. I regret to say that a shower bath has not been considered a necessity for a European regimental hospital by Dr. Graham, the superintending surgeon of this division, and, consequently, my repeated and urgent request for one through the officer commanding the regiment has been refused. 11. Without a bath-room properly furnished and fitted up specially as such, the answer to this question must be in the negative. 12. The hospital purveyor is responsible for the washing of the linen, and issuing it, when required, dry. The linen during the monsoon is always more or less damp, but it is aired beneath the hospital in such cases by means of charcoal fires placed beneath bamboo frames, upon which the linen or bedding is placed. 13. The storage is not sufficient, nor does it afford sufficient protection from damp in a climate like Burmah. It is a small wooden structure; the store ought to be a pucka building. 14. The bedsteads now in use are strong wooden frames with strong cane bottoms and light iron fixings wherewith to fasten a mosquito frame. The beds are made of cotton

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References to Subjects and Queries.	REPLIES.
Hospitals—*cont.*	

ticking filled with straw; the pillows are now filled with coir; a blanket, cotton coverlid, and a pair of sheets are supplied, and changed whenever ordered by the surgeon; sheets and night-shirts are invariably changed twice a week.

The *bedsteads* appear admirably suited for this climate, as there do not appear to be any bugs harboured by them, as in India, where charpoys are preferred for this reason. The straw supplied for the *bedding* is very indifferent, and a hair mattress is the only proper bedding as regards comfort and economy: the curled hair can be weighed, and when necessary can be washed; the expense is only for the first outlay; some of the fibres which have from time to time been proposed as substitutes for curled hair might with advantage be used for bedding, in lieu of the dirty paddy straw obtained in this country.

15. There are two pucka-built kitchens, one close to the southern extremity of the hospital range, and one at its northern extremity; both are to the eastward of the bungalows, and only a few feet from them.

The means of cooking are very limited, and consist merely of chatties, frying-pans, and kettles. There is no such thing as a kitchen range or boiler, turnspit for roasting, &c.

The cooking of diets is but very indifferently done, and cannot be sufficiently varied under existing arrangements.

16. Copies of forms in use are annexed.

17. The following table will show what a regimental hospital is entitled to in respect to serjeants, nurses, &c.:—

Hospital Serjeant.	Writer.	Purveyor.	Assistant Purveyor.	Cook.	Assistant Cook.	Cooly Maistry.	Coolies for leeching, &c.	Ward Coolies.	Sweepers.	Toties.	Puckalies.	Tailors.	Dhobies.	Female Nurse.	Cooly Woman.
1	1	1	1	1	1	1	3	8	3	3	2	2	2	1	1

The duties of the hospital serjeant are manifold, and occupy all his time; he is entrusted with the entire discipline, dress, and is responsible for the conduct and behaviour of the convalescents and sick, whether out or in hospital.

The native servants, especially those supplied to the hospital here, are not trustworthy, and require the greatest vigilance on the part of the subordinates to ensure any work being done. The complaints here against the hospital ward coolies, toties, and sweepers, by the hospital serjeant and by the senior apothecary, are frequent, for drunkenness, absence without leave, and inattention to the patients, and generally to their duties.

Whenever a man is seriously ill it consequently becomes necessary to apply for the services of a European soldier to wait on him, else he would not receive the care or attention he requires, or is presumed to have.

Under these circumstances I cannot say that the attendance for the sick provided by regulation is of the kind it ought to be, or what *à priori* might be expected from looking merely at the above table, without knowing the working of the system.

18. I think that, on the whole, the sanitary condition of my hospital is good, notwithstanding any drawbacks I have mentioned.

The sick have never been attacked with hospital gangrene or pyæmia within its wards.

Bowel complaints and fevers have appeared from time to time in an epidemic form, according to the season and time of year, induced, I believe, in a great measure by local influences of a remediable nature, but not confined to the immediate vicinity of the hospital.

19. Many suggestions occur to me with respect to this question.

1st. The cantonment should be cleared *far* and *wide* of jungle, and subjected to an extensive and efficient drainage.

All squatters and camp followers should have their places of residence told off for their use, and their huts ought to be erected by the Government on a definite and suitable plan, instead of allowing them to congregate as now in any number and with or without shelter, as the case may be; a strict and efficient police should then enforce cleanliness and order and prevent the clandestine sale of liquors, spirits, fruits, bad meat, fish, &c.

Dhoby's tank should not be used for washing clothes. It might, with some little expense perhaps, be made a suitable swimming bath for the regiment, and *officers* of the cantonment generally.

The dhobies should not be allowed to wash clothes nearer to the hospital than the large Lake, where suitable sheds might be erected under regulations calculated for the purpose.

Roads ought to radiate, as it were, farther into the jungle from the cantonment, and a road for driving round the large Lake should claim attention. While these measures generally are called for for the well-being of the sanitary condition of the hospital and the cantonment, it is quite as essential that the adjoining town of Rangoon and villages of Posendoun and Kemendine should be placed under the surveillance of an efficient sanitary police.

Diseases are there generated in excess, as the mortality of the last quarter will show, which are to all intents and purposes preventible, and might at any moment be wafted northward to our men, and then the tale is soon told; a fine regiment becomes panic-struck, perhaps decimated. With every death the Government loses 150*l.*—it cannot be less, besides a European and a soldier, whose loss can hardly be estimated in India by money.

2nd. The dieting of the sick is capable of much improvement. I would suggest what I have repeatedly done before, that mutton be issued to the sick every day, instead of every second day as now. Mutton is the best flesh for a sick man as a standing dish. It is more manageable for the purposes of division into chops, and best suited for a weak digestion, an almost universal concomitant of disease in this country.

Some alteration in the mode of preparing the diets is also required.

References to Subjects and Queries.	Replies.
Hospitals—*cont.*	If a quarter or two of mutton were occasionally roasted, and served up as for a mess in a joint, it would be a great change on the present regulation plan of boiling, so as to make a proportion of broth, and would afford more nourishment and give zest to the failing appetite. The joint in this case should be cut when on the table, and served out under proper directions, instead of being cut up, as now, by native cooks, whereby I have every reason to know peculation is carried on, and cannot be prevented under the present system. Enough messing articles are not issued for the comfort and convenience of the sick soldier. Everything necessary for enabling him to partake of his meals comfortably, when once well served, should be supplied from the hospital establishment; and he should not be dependent on his own kit for a knife, fork, spoon, &c. The same "tin" that holds his morning milk or tea may be, and generally is, used to carry his mutton broth or chicken soup at noon, again to be used for tea in the evening, or, mayhap, some beer or wine and water, if ordered. It is almost certain to be greasy, which often produces an indifference, if not a loathing for food, when nourishment is of great importance. I would suggest such articles, including common porcelain soup bowls, tea cups, &c., be supplied in sufficient quantity, and in proportion to the size of each ward. As has been above said, the native hospital servants fall far short, at all events in Burmah, of their duty, require close watching and troublesome urging to obtain even moderate work from them. I would suggest that a soldier of experience and established good character should be allowed to take the superintendence of the hospital kitchens, to ensure care and cleanliness in cooking the diets and the extras, and prevent anything like peculation, which I fear will never be avoided without such European supervision. He would receive any particular instructions from the surgeon regarding the cooking of food or extras for particular patients, and see all served hot and comfortable. 20. The convalescents and sick generally take daily exercise morning and evening, either walking or riding in "sick-carts" or in doolies. Indents are made for the quantity and kind of carriage required for the following day upon the commissariat department, and the authority of the major-general sanctions what may be indented for by the surgeon. The exercise is taken on the roads of the cantonment and in the cantonment gardens, which are provided with seats. The senior non-commissioned officer present is responsible for the conduct, &c., of the sick and convalescents while taking exercise. 21. There is no provision whatever for the treatment of the soldiers' sick wives and children. But it is right to state that hitherto there has not been a necessity for such provision, as the families of the men have not as yet arrived in the country, although they are now daily expected. A regular female hospital, with a lying-in ward, is absolutely necessary. 22. I know of no local hospital regulations. 23. The medical officer can only represent matters appertaining to the sanitary state of his hospital. His representation or recommendation may be approved or disapproved of by the authorities, or wholly disregarded. As to diet, it is prescribed by regulation. Any change in the items composing it might be deemed very necessary by the surgeon, but the change could not be effected unless the superintending surgeon recommended it also, as is the case at this station now. I have recommended the issue of mutton to be daily. The superintending surgeon says no, and it is not issued. The surgeon can order anything in the shape of an extra to his patient when it is procurable (mutton is only procurable every second day), as wine, beer, eggs, &c., at his discretion. I have already shown that the surgeon has no power practically as regards the means and appliances for medical treatment. He cannot obtain a shower bath for a regiment of some 1,300 men, because the superintending surgeon does not think it necessary. He cannot procure the medicines for his hospital, except so far as the superintending surgeon thinks fit to sanction them. For example: at this station my requisitions for quinine are always curtailed to a minimum, viz., one pound, a quantity that might be used with the 68th Light Infantry in two days, were it considered necessary by me to administer the medicine as a prophylactic agent. On one occasion there was none of this indispensable drug in the division stores to meet my requisition, and I was obliged to do without it till some was received from Calcutta. At this present time my requisition for iodide of potassium, an indispensable medicine in any hospital, has been returned to me with the remarks, and them only, "none in store." At the same time, my requisition for camels' hair pencils for the treatment of eye diseases was returned to me with the remarks, "not sanctioned." Thus it must appear that the surgeon who *alone* has the treatment, and who is *alone* responsible for the health of his regiment to his commanding officer on the spot, and to the Director-General of the Medical Department in London, is practically without powers, which is the answer to the question. 24. There is no convalescent hospital at this station. There are no wards in my hospital to spare for such a special use. In case of much sickness, indeed always, a separate hospital for convalescents is most desirable. (Signed) Geo. Peacocke, M.D., Staff Surgeon, in Med. Charge 68th Regt. Light Infantry. Rangoon, 2nd February 1860. N.B. I would wish to bring specially to the notice of the committee, and in reply to question No. 23, that the surgeon has not power, it would appear, to reject rations, as bread and meat, which he may consider as objectionable. He can call for a board or regimental committee under such circumstances, and it may happen that, by the decision of such committee, the surgeon's opinion may be dissented from altogether, by which the power of regulating the *quality* of the rations for the sick is virtually taken from the surgeon, who is, in nine cases out of ten, and always ought to be, the best judge of the quality of bread, meat, &c. Such is the local custom, at least, that obtains. G. P.

RANGOON. BRITISH BURMAH. MADRAS.

APPENDIX E.

6TH REGIMENT NATIVE INFANTRY.—HOSPITAL.

References to Subjects and Queries.	REPLIES.
HOSPITALS.	2. The hospital is situated between the most easterly barrack and the Kemendine road; rather inconveniently near the latter. Distant 150 paces from the nearest barrack. Not near any bazaar. On an open, freely-ventilated site. Not in the neighbourhood of any marsh or other probable source of malaria. 3. The water supply is abundant and wholesome. 4. The drainage is effected by trenches cut in the ground, which itself has a slight natural slope. 5. The lowest and only ward is raised seven feet from the ground, which allows a free passage of air below. There are gutters for the removal of the roof water, but as the soil is soft it must partly sink into it. At one spot, just in front of the gate, the water is apt to collect, but from the same cause (sandy soil) it soon disappears. The hospital is of wood throughout, the floor of planking, the walls of double matting, and the roof of "shingle," lately substituted for thatch. The verandahs on both sides consist of a projection of the roof beyond the walls to a horizontal breadth of nine feet, and are not of a nature to be used as accommodation. The hospital consists of one flat. Date of construction, not known. Total number of wards, 1. Total regulation number of beds, not fixed.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each.	Dimensions of Ward.			Cubic Feet per Patient.	Superficial Area in Feet per Patient.	Height of Patients' Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.				Number.	Height.	Width.
1	—	122 ft.	20 ft.	14 ft.	455½*	32½*	1 ft. 10 in.	21	4½ ft.	4½ ft.

* These numbers are calculated on the supposition of 75 patients, the largest number that has been in the hospital, and are exclusive of the space in the angle of the roof.

	The hospital is open to the wind on all sides. The windows are of glass, and open outwards in two pieces like folding doors, affording plentiful and manageable ventilation. 6. Included in the last answer. 7. No means of cooling the air used. 8. No means of warming are required. The walls and roof are not limewashed. They are cleaned once a quarter. 9. The privy is an oblong house, containing two fixed wooden troughs, opening out by the back of the house. The greatest number that can use it at one time is eight. There is no drainage, water supply, or cesspit; but the night-soil is daily removed. It is not offensive, except within a short distance at the back. 10, 11, 12. Do not apply to the arrangements of a native hospital. There is a large tub for warm baths. 13. The storage is sufficient and dry. 14. The bedsteads are of rattan work, stretched on a simple wooden frame. The sick can be supplied with coarse blankets, if required, but usually provide better ones of their own. 15. The cookhouse is a simple brick building, roofed with tiles, and containing a few earthen fire-places. Nothing more is required. 16. The only diet roll in use is a list of the men receiving other diet than their rations, mentioning the articles. When a man in hospital is recommended special diet his ordinary rations are not interfered with, so that all special diet becomes at the same time extra diet, forming an evident temptation to a man to exaggerate his complaint. The statistical forms are the usual ones of a native corps, and are given in the code of Medical Regulations (pp. x., xi., xii., xix., xx., xxi., xxiii., xxviii., xxix., xxx., xxxi.), and I believe also in the General Regulations. 17. One havildar and two orderlies are attached to the hospital, and are found sufficient. Any man so ill as to be helpless is usually allowed to name an orderly to attend specially on himself. 18. In good sanitary condition, and has not been subject to epidemics. 19. No improvements to suggest. 20. No shaded walks for convalescents required. 21. Wives and families not with the regiment, except a few East Indians, who are attended, when necessary, at their houses. 22. No local hospital regulations. 23. No repairs have been lately required, but the hospital building has been considerably improved. At this station the medical officer has some power as to change of hospital diet; in camps and on march, none. 24. No convalescent hospital required. A man being discharged before he is fit for duty is quite an exceptional case; and in such case he is usually allowed, on the representation of the medical officer, exemption from duty for a time.

Rangoon, 23rd February 1860.

D. CAMPBELL, M. D.,
Assistant Surgeon, 6th N. I.

APPENDIX F.

23RD REGIMENT NATIVE INFANTRY.—HOSPITAL.

SIR, Rangoon, 2nd April 1860.

I HAVE the honour to acknowledge the receipt of your letter of 26th March 1860, with series of questions on the subject of hospitals, and beg to annex a rough ground plan and elevation of the hospital 23rd Regiment Light Infantry at Rangoon.

References to Subjects and Queries.	REPLIES.
HOSPITALS.	2. The hospital is situated on the left rear of the lines of the regiment, and at a convenient distance. There is no bazaar near, and the civil inhabitants are at a considerable distance. There are no buildings, walls, or trees to interfere with ventilation, and the site appears to me unobjectionable. My short experience of Rangoon renders me unable to answer question No. 2 more fully. 3. There are four bowries for the supply of water in the lines, which give a sufficient supply of good water during nine months of the year, but at present there is considerable scarcity of water, and it is dirty and muddy, requiring to be filtered by the sepoys before it can be used. The sick sepoys in hospital are dependent for their supply of water on the regimental puckalies. I am of opinion that it would be of advantage if one or more puckalies, as might be required, should form part of the hospital establishment, and be ready at any moment to bring a sufficiency of water for hospital purposes. 4. The hospital is surrounded by a gutter, which carries the water in the rainy season into a large nullah, at a considerable distance from the hospital. The filth of the necessary (urine and fæces) is carried away to a distance by a conservancy cart daily. 5. The large ward of the hospital is raised on piles 7 feet from the ground, and the four small rooms at each corner are 3 feet 7 inches from the surface. The ground part of the hospital has also recently been walled in and converted into a ward, to be used when necessary, but, of course, will not be available in the rains. The roof water falls directly into the gutter surrounding the hospital and is carried off. The gutter I have mentioned is, I am informed, sufficient to carry off the rain water as rapidly as it falls. The hospital is built of piles, planks, tatties, and bamboos; the roof being of bamboos and cocoa-nut leaves. The walls and the roof are single, and the heat during the day in the hot season is very great. A verandah or pandal surrounds the hospital all round, the breadth of which is 10 feet, and which is sufficient to prevent the direct rays of the sun from entering the hospital. This verandah is never used for patients of any description. There are, of course, two flats in the hospital, if the ground part is to be considered a flat. Accompanying this letter will be found the table required. The hospital is so situated as to be open to the wind on all sides. There are 10 glass windows on each side of the large ward, 5 feet in height and 5 feet in breadth. Each window is in two pieces, and opens outwards. The hospital is sufficiently ventilated by these windows and other means. 6. The ventilation of the hospital is carried on by means of the windows, doors, and floor, and appears sufficient to keep the hospital free from odour or closeness. 7. There are no artificial means used for cooling the air entering the hospital. I am of opinion that punkahs would be of great advantage to the sick in native hospitals. Orderlies are frequently employed in bad cases with hand fans, but a few coolies would be sufficient to pull the punkahs for the whole hospital. 8. There are no artificial means of warming the air in use. The walls and ceiling have never been whitewashed. They are swept down occasionally. 9. The privy is an ordinary tatty building 26 feet long by 10 broad, and 7½ feet height, situated at the north-west corner of the hospital compound, at a distance from the hospital of 102 feet. The ordure is removed daily by the toties and a conservancy cart. The privy ought to be a pucka building. 10. There are no lavatory arrangements in use in the hospital. The patients clean themselves in the hospital compound, each after his own manner. 11. There are no baths attached to the hospital. I have often wished to be able to prescribe warm baths to patients with cutaneous diseases (which prevail greatly in Burmah). 12. The hospital bedding, &c. is washed by dhobies, supplied by the commissariat on monthly indent. 13. The store-room is sufficient for the purposes required and dry. 14. The usual number of cots and bed-clothing allowed to native hospitals are in use in the 23rd Light Infantry hospital, viz., 19 barrack cots of wood and rattan work, 7 feet 4 inches long, 2 feet 11 inches broad, and 1 foot 7 inches in height, and the necessary supply for these of pillows, quilts, paillasses, &c. This number of cots is perhaps sufficient in the more healthy stations in India for the whole sick of a regiment, but in Burmah I consider that at least fifty (50) cots should be supplied to a native regiment, with the requisite bedding, &c. 15. A pucka building has just been erected at the east side of hospital compound, 33 feet long, 18 feet broad, and 10 height, as a kitchen for the use of the patients, who all cook their own diet by themselves, or when too sick by orderlies. There is no cooking in the hospital otherwise. Patients, when suffering from pretty severe illness, yet not dangerously ill, always wish to have orderlies to cook for them, and I have found it almost impossible to arrange so that one orderly might cook for several patients, their caste prejudices being so inveterate. Would not a high-caste Hindoo and a Mussulman cook be advantageously attached to the establishment of a native regiment when on foreign and field service, thus obviating the withdrawal from the ranks of numerous trained sepoys for cooking purposes? 16. The patients in a native hospital supply their own diet (except in a few exceptional cases in Burmah); there are no diet tables or diet rolls. Annexed will be found a copy of the monthly return for February 1860, which will show how the statistics of the hospital are kept. A return for the whole year, in almost the same form as the monthly return, is sent annually. 17. A native hospital has usually a havildar or naique, who looks after the cleanliness, and keeps order among the patients. There are no nurses, but each patient, at the discretion of the medical officer, is allowed an orderly comrade when too sick to look after himself. 18. The hospital of the 23rd has never had any epidemic disease prevailing in it that I am aware of.

References to Subjects and Queries.	REPLIES.
Hospitals—*cont.*	19. I see nothing to improve (with the exceptions previously mentioned—privy, baths, &c.) in the hospital as a native hospital, except that a superior kind of roof would be of advantage, the present bamboo and leaf roof not being thick enough to keep the hospital cool in the hot weather. 20. There is no provision made for convalescents taking exercise. 21. In native regiments, families, when present, receive medicine from the hospital, and are visited by the medical officer or subordinates in their huts when necessary. 22. There are no special local hospital regulations in force at this station that I am aware of, except that the medical officer in Burmah can order extra diet in certain cases to the sick. 23. The medical officer has no power practically to order any repairs, &c., in hospital, or to choose the site for encamping grounds. He communicates with his commanding officer when he considers that anything is required. In Burmah, as mentioned above, he can supplement the diet of the natives provided by themselves with a few articles of extra diet, such as chicken, mutton, milk, and wine, &c., when necessary. 24. I am unable to state whether there are any convalescent wards for convalescent patients at this station; there is none attached to the hospital under my charge, and indeed is not required for natives, their best convalescent ward being a hut in their native country.

I have the honour to be, &c.,
JAMES ADAMSON, Assistant Surgeon,
23rd Regiment Light Infantry.

To Col. Croggan,
President of Special Committee.

Date of construction not known.
Total number of wards, 1.
Total regulation number of beds.—No regulation number of beds.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Ward.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
One large room,	No regulation.	120 feet	20 feet	Walls 12 ft. Ceiling 18 ft.	36,000 feet	- - -	- - -	1 ft. 7 in.	10 on each side; Total 20	5 feet	5 feet

February 1860.—23rd Regiment Light Infantry.—MONTHLY RETURN of NATIVE SICK.

Classes of Diseases.	Specific Diseases.	Native Commissioned, Non-commissioned Officers, Privates, and Musicians.											European Commissioned Officers.	
		Remained last Return.	Admitted in.	Total treated.	Discharged from the Hospital.							Died.	Remaining.	Reported Sick.	Died.
					Cured.	Transferred Sick.	Invalided Sick.	Pensioned Sick.	On Sick Leave.	And from the Service, &c.	Total.				
Fevers	Feb. Ephemera	1	1	2	2	-	-	-	-	-	2	-	-	-	-
	„ Quot. Int.	3	8	11	6	1	-	-	-	-	7	1	3	-	-
	„ Remittens	1	2	3	2	-	-	-	-	-	2	-	1	-	-
Dis. of the Lungs	Bronchitis Ac.	-	1	1	1	-	-	-	-	-	1	-	-	-	-
	Catarrh Ac.	3	-	3	3	-	-	-	-	-	3	-	-	-	-
	Phthisis, P. T.	-	2	2	-	-	-	-	-	-	-	-	2	-	-
Dis. of the Stomach and Bowels	Diarrhœa	3	6	9	7	2	-	-	-	-	9	-	-	-	-
	Dyspepsia	4	1	5	3	1	-	-	-	-	4	-	1	-	-
Dis. of the Brain	Paralysis	1	-	1	-	-	-	-	-	-	-	-	1	-	-
Dropsies	Anasarca	2	1	3	1	1	-	-	-	-	2	-	1	-	-
	Beri-beri	47	20	67	28	14	-	-	-	-	42	1	24	-	-
Rheumatic Affections	Arthritis	1	-	1	-	-	-	-	-	-	-	-	1	-	-
	Lumbago	-	2	2	1	-	-	-	-	-	1	-	1	-	-
	Rheum. Ac.	-	1	1	-	-	-	-	-	-	-	-	1	-	-
	„ Ch.	9	3	12	4	2	-	-	-	-	6	-	6	-	-
Venereal Affections	Bubo Simplex	4	1	5	1	-	-	-	-	-	1	-	4	-	-
	Orchitis	-	1	1	1	-	-	-	-	-	1	-	-	-	-
	Phymosis	1	-	1	1	-	-	-	-	-	1	-	-	-	-
	Syphilis Consecut.	1	-	1	-	-	-	-	-	-	-	-	1	-	-
Abscess and Ulcers	Phleg. Abscess	1	4	5	5	-	-	-	-	-	5	-	-	-	-
	Ulcers	2	4	6	6	-	-	-	-	-	6	-	-	-	-
Wounds and Injuries	Ambustio	-	1	1	-	-	-	-	-	-	-	-	1	-	-
	Contusio	2	3	5	4	-	-	-	-	-	4	-	1	-	-
	Vulnus Incisum	1	-	1	1	-	-	-	-	-	1	-	-	-	-
Dis. of the Eye	Nyctalopia	1	-	1	-	-	-	-	-	-	-	-	1	-	-
Dis. of the Skin	Psora	8	6	14	13	-	-	-	-	-	13	-	1	-	-
	Psoriasis	-	1	1	-	-	-	-	-	-	-	-	1	-	-
Other Diseases	Atrophia	2	5	7	3	1	-	-	-	-	4	-	3	-	-
	Carditis	1	1	2	1	-	-	-	-	-	1	-	1	-	-
	Otitis	-	1	1	1	-	-	-	-	-	1	-	-	-	-
	Scrofula	1	-	1	1	-	-	-	-	-	1	-	-	-	-
	Tumores	1	-	1	1	-	-	-	-	-	1	-	-	-	-
	Total	101	76	177	97	22	-	-	-	-	119	2	56	-	-

February 1860.—23rd Regiment Light Infantry.—Monthly Return of Native Sick—*cont.*

	Native Commissioned and Non-commissioned Officers, Privates, and Musicians.	European Commissioned Officers.
Numerical Strength	741	8
Average daily Sick	72½	—

ABSTRACT of the preceding Return.

Classes of Diseases.	Remained.	Admitted.	Total treated.	Discharged.	Died.	Remaining.	Remarks.
Fevers	5	11	16	11	1	4	
Eruptive Fevers	—	—	—	—	—	—	
Disease of the Lungs	3	3	6	4	—	2	
Disease of the Liver	—	—	—	—	—	—	
Disease of the Stomach and Bowels	7	7	14	13	—	1	
Disease of the Brain	1	—	1	—	—	1	
Epidemic Cholera	—	—	—	—	—	—	
All other Diseases	85	55	140	91	1	48	
Total	101	76	177	119	2	56	—

Of NATIVE COMMISSIONED and NON-COMMISSIONED OFFICERS, PRIVATES, and MUSICIANS.

	Number.	Out of Hospital.	Number.
Admitted by transfer	4	Invalided	—
Convalescent of the corps not included in this return.	—	Pensioned	—
		Proceeded on sick leave	—
Recruits joined	—	Discharged the Service, &c.	—
		Died	1

DETACHMENT of the CORPS incorporated in this Return.

Detachment at Bassein, Strength 151.

RETURN of MEDICAL OFFICERS and SERVANTS.

Names.	Rank.	Date of Rank. In the Army.	Date of Rank. In the Regiment.	Remarks.
J. Adamson	Assistant Surgeon	1st April 1854	17th Sept. 1859	Joined 27th Feb. 1860; present.
T. Condasaumy, No. 488	2nd Dresser	12th May 1859	1st June 1859	Present.
Sunthea	Toty	22nd April 1857	22nd April 1857	Present.
Doing Duty.				
R. Dampster	Assistant Surgeon	—	26th Oct. 1859	Not joined.
W. F. Davis, M.D.	Do.	28th July 1857	11th Jan. 1860	Relieved from D.D., vide D. O., 10th Feb. 1860.
J. Lutchmial Nindros, No. 470	2nd Dresser	4th May 1857	30th Dec. 1857	Present.

TABLE showing the Strength of Native Commissioned and Non-commissioned Officers, Privates, and Musicians, &c. (given in the 1st page), under the following two Classes.

Caste.	Years of Age. 20.	25.	30.	35.	40.	45.	50.	Above 50.	Years of Service. Under 1.	1 to 2.	2 to 3.	3 to 4.	4 to 5.	5 to 6.	6 to 7.	7 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	Above 30.	Total.
Hindoos	70	73	82	93	112	51	8	1	80	62	38	26	16	30	42	34	40	41	53	20	8	490
Mahomedans	25	16	24	32	48	51	15	4	30	32	11	12	14	17	15	11	17	20	20	6	10	215
Europeans, E. I. &c.	4	6	7	8	9	2	—	—	—	5	—	—	2	4	6	4	6	4	5	—	—	36
Total	99	95	113	133	169	104	23	5	110	99	49	38	32	51	63	49	63	65	78	26	18	741

Rangoon, 1st March 1860.

(Signed) JAMES ADAMSON, Assistant Surgeon, 23rd Regiment Light Infantry.

RANGOON. BRITISH BURMAH. MADRAS.

APPENDIX G.

41ST REGIMENT NATIVE INFANTRY.—HOSPITAL.

References to Subjects and Queries.	Replies.
HOSPITALS.	2. The hospital of the 41st Regiment Native Infantry is situated on open ground about 100 yards or less to the north of the barracks, and to the south of the officers' lines, at a distance of ½ or ¾ of a mile from the town or bazaar; the site is open and freely ventilated, with a few trees in the neighbourhood, but not so many as to impede ventilation. Its situation is sufficiently well drained, but to the north-east, at a distance of 200 yards, is a pond which dries up in the dry weather, and is in my opinion prejudicial to the lines and hospital by causing malaria; this is, however, a moot point. 3. The water supply is tolerably abundant, except at the end of the hot weather, and I believe it to be wholesome; it would, however, be very much improved by filtering. 4. The ground slopes down from the hospital towards the river; there is no sewage, the ordure from the latrine being removed daily in carts. 5. The hospital of the 41st Native Infantry is a wooden building with mat walls and a thatched roof, which is going to be shingled. The roof is 140 feet long by 40 feet broad, but the walls enclose less than half this space, as there is a verandah of protection 10 feet broad round the four sides, leaving a space 120 feet long by 20 broad, with a floor of planks raised 6 feet from the ground. The building faces the south, where there are four doors 7 feet 10 inches high by 4 feet 10, and eight windows 4 feet 10 inches square; there are ten windows of the same size behind, and one door at either end. There was of course free perflation of air under the floor, but I was obliged to get the eastern half of the under portion of the hospital matted in, the upper portion being insufficient to hold all the patients. There is no provision made for carrying off the roof-water, nor is it necessary, as the soil is porous and slopes towards the river. I consider the hospital an excellent one for natives; it is sufficiently cool, and the verandahs afford abundant protection from the sun's rays; it is also a good protection from the cold and damp. Ventilation is ample from the doors, windows, roof, and floor. The windows are each in two portions, and open outside. 6. No particular contrivances are used for ventilation, and there are no jalousies, the windows being glass and the doors panelled. 7. Native hospitals hardly require to be cooled. 8. The walls were once whitewashed, because there were many patients with bad ulcers. 9. There are latrines at a short distance from the hospital, from which the ordure is removed daily in carts. 10, 11, 12, and 13, apply rather to European hospitals. 14. The cots are of teak rattaned, and there are cumblies and coverlets. 15, 16, 17, refer to European hospitals. 18. I consider the sanitary condition of the hospitals at Rangoon to be good. There are occasionally ulcers of the gangrenous kind, but not in my opinion attributable in any way to the construction of the hospitals. 19. The hospital would be improved by having a fence round it. 20 and 21, apply to European hospitals. 22. There are no special regulations that I am aware of in Rangoon. 23. I never had any difficulty in procuring obtainable comforts for the sick, or in getting any repairs or improved sanitary arrangements in hospitals. 24, applies rather to European troops.

Total number of wards, 1.

Total number of beds.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
1 - -	40, but will contain 80 if closely packed.	120 feet	20 feet.	12 feet to the tie-beams.	28,800 feet to the tie-beams.	360 to 720, according to the number of patients.	From 30 to 60, according to the number of patients.	1½ feet, but all are not on beds.	18	4 ft. 10 in.	4 ft. 10 in.

Rangoon, 5th March 1860.

E. S. TRIBE, Surgeon,
41st Regiment Native Infantry.

TONGHOO.

Accommodation —
- Queen's Troops — Artillery - - - - 99
- Queen's Troops — Infantry - - - - 582 H.M. 69th Regiment.
- Native Troops — Artillery, Gun Lascars - 45
- Native Troops — Sappers - - - - 152
- Native Troops — Infantry - - - - 984 2d Regiment M.N.I.

References to Subjects and Queries.	Replies.
I. TOPOGRAPHY.	1. The adjacent country is flat, marshy, and jungly. The soil is compact red sand. There are extensive paddy fields under cultivation all round the station. There is some undulating ground near the Sittang river to the east of the cantonments, which is well wooded. Across the river and distant about a mile laterite is found in great quantities, also valuable timber trees, such as teak, padauk eeiu, pengado, sal or eughine, pema, and various others.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	2. The cantonment is situated about 300 feet above the level of the sea. It is on a plateau having an elevation of some 30 or 40 feet above the surrounding country. It is bounded on the east by the Sittang river; and during the S.W. monsoon, which commences towards the end of May, and terminates in October, the surrounding country is one universal marsh. There is no ground adjoining the station. sufficiently capacious for a cantonment, which is either higher or healthier. "Report of E. O'Reilly, Esq., late district commissioner at this station. "The want of a position in the vicinity of the station, affording a change of temperature from that of the plains, has long been considered a desideratum, and on former occasions of my ascent of the ranges nearest the valley, the subject has had my attention both in regard to altitude, space on the surface, and means of access; I had hitherto not succeeded in selecting a position adapted for the purpose until my reaching the 'Bangalee' range on my return route; the position, at a height of 500 feet, possesses a broad surface sufficient for the requirements of a building accommodation, is connected with other ranges by a ridge line of easy inclines, is free from jungle vegetation, is distant from Tonghoo about 28 miles, which place is visible from the position, and from the hot springs 8 miles, which occur at the base of the range at a height above the plains of 540 feet; a supply of pure water is obtained at a moderate distance below, and the range of the thermometer 63°–78° during the few days of my stay there. Hence should the hot springs be found to possess restorative properties, and it be desirable to apply them to such purposes, the position of the Bangalee range affords the necessary requirements for the formation of a sanatarium for temporary resort during the periods of extreme heat and humidity of atmosphere of the plains." 3. The nearest range of mountains are distant about 12 miles, the elevation of the highest of which is but 2,000 feet above the level of the sea. The eastern range, distant about 15 miles, varies in elevation from 2,000 to 6,000 feet high; the table land being distant from the station about 28 miles (vide above report). 4. The station is situated on the Sittang river. There are various mountain streams and other creeks which fall into the Sittang river not far distant from the cantonments. There are several jheels within the old town walls of Tonghoo, the ditch of which passes through a portion of the cantonment. The surrounding country is one universal swamp during the monsoon, but more particularly so during the four latter months of its continuance. The rains fill the numerous creeks and ravines not far distant from the cantonments, but with no injurious effect on the health of the troops here. 5. The station is surrounded with dense jungle, but being situate on a plateau, the ventilation is not much affected thereby. There is still some jungle in the cantonment, but it is being rapidly cleared away. The Burmese are in the habit of burning their jungle periodically, which fires endanger the safety of the public buildings. It should be cleared away at least a mile from the cantonment boundary. The temperature of the station is not affected by reflected sun heat, but it is increased by the fires all round the station during the hot months. From November to February cold northerly land winds prevail, the sea is distant about 160 miles due south. During the cold season dysentery cases are aggravated, and during the southerly winds fevers prevail. 6. The greater part of the surrounding country is cultivated with paddy. No works of artificial irrigation exist. There is no cultivation of rice or indigo, nor is the preparation of hemp or flax carried on near the station. 7. The old town of Tonghoo, little more than a mile square, is in the immediate vicinity of the cantonment. Its population is stated to be 3,939 adults, and 2,513 children. 8. No geological survey has yet been made of the district; most of the minerals exist in small quantities. There are lime, laterite, and iron ore in great quantities. The subsoil is generally compact red sand, but very valuable clay for pottery is also found. The cantonment was formerly occupied by Burmese population, but had to be cleared of jungle and brushwood by us. 9. Water is found during the dry season about 30 feet below the surface, and during the rainy season almost at the surface. 10. The rain-fall and surface water flows readily from the station; but in the lower ground adjacent the water lies on the surface till evaporated. There is no higher ground adjacent, the drainage of which passes into the subsoil of the station. 11. The water-supply of the station is derived partially from the river, but principally from wells. It is not stored in open tanks. No tanks exist. The wells are protected by a thatched covering from all impurities. 12. The supply of water is ample and very good. In the monsoon, being turbid, it requires filtration. The water is hard, colourless, tasteless, and devoid of odour. Bheesties distribute the water. No better supply can be wished for. 13. The climate of the station is favourable to the European constitution. The native troops suffer in some measure from climate, but there is reason to believe their general health would be improved by the addition to their rations of animal or other solid food. 14. The site of a station is generally at first chosen by the principal military and engineer authorities, and afterwards reported on by a medical committee; the highest ground and the most advantageous for defence in a military point of view, and the most accessible by water, is that which is generally preferred. Jungly ground, never before inhabited, should not have troops located on it till three years after its clearance, as, for example, the unhealthiness of Nunyan and Shoayghine, which were occupied immediately after clearance; the former had to be given up, and the latter is still very unhealthy.

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References to Subjects and Queries.	REPLIES.

II. CLIMATE.

1. No instruments available at the station for taking meteorological observations.

2. The following table has been compiled from the hospital returns of Her Majesty's 69th Regiment, from January 1859 to December 1859.

Months.	Thermometer. Mean Maximum.	Thermometer. Mean Minimum.	Thermometer. Mean Dry Bulb.	Thermometer. Mean Wet Bulb.	Rain, Inches.	Winds. Direction.	Winds. Force.	Remarks.
January -	82	57	$69\frac{1}{2}$	61	—	N.E.	Moderate	Clear.
February -	90	63	$76\frac{1}{2}$	65	—	N.E.	Moderate	Clear.
March -	90	70	80	69	1·90	N.E.	High Winds.	Clear.
April - -	$98\frac{19}{30}$	$80\frac{15}{30}$	$89\frac{17}{30}$	$79\frac{2}{30}$	2·40	N.E., S.W.	High Winds.	Clear.
May - -	$90\frac{24}{31}$	$78\frac{2}{31}$	$84\frac{18}{31}$	$76\frac{30}{31}$	6·35	S.W.	Monsoon.	Clear, with thunderstorms.
June -	$83\frac{26}{30}$	$77\frac{18}{30}$	$80\frac{22}{30}$	$77\frac{17}{30}$	16·83	S.W.	Monsoon.	Clear, do.
July -	$84\frac{1}{31}$	$76\frac{24}{31}$	$80\frac{12}{31}$	$77\frac{6}{31}$	11·95	S.W.	Monsoon.	Clear, do.
August -	$84\frac{27}{31}$	$76\frac{16}{31}$	$80\frac{21}{31}$	$77\frac{14}{31}$	14·90	S.W.	Monsoon.	Clear.
September -	$85\frac{19}{30}$	$75\frac{27}{30}$	$80\frac{23}{30}$	77	9·30	S.W.	Monsoon.	Clear, occasional thunderstorms.
October -	$86\frac{12}{31}$	$75\frac{1}{31}$	$80\frac{22}{31}$	$76\frac{3}{31}$	4·70	S.W., N.E.	Monsoon.	Clear.
November -	$83\frac{28}{30}$	$68\frac{27}{30}$	$76\frac{18}{60}$	$71\frac{18}{60}$	1·05	N.E.	Moderate	Clear.
December -	$82\frac{5}{31}$	$65\frac{29}{31}$	$74\frac{8}{62}$	$68\frac{13}{31}$	0·05	N.E.	Moderate	Clear.

3, 4. The climate for a tropical one is good; from November to February the nights and mornings are very cold, the thermometer falling down at times to 49° Fahrenheit; during the day it is dry and hot, with heavy dews at night and fogs in the morning. From 1st March to end of May it is very hot and sultry, the thermometer being 105° (?) in the shade; from June to October close and very damp, thermometer 81°. During the hot season the station is enveloped in clouds of dust, owing to there not being any sanctioned modes of watering the roads; the cantonment would be greatly improved if this was done. The European troops are well rationed, but an addition of animal or other solid food to the native ration would be an advantage, nothing of the kind being procurable here in the bazaar. Clothing of serge and other light woollen material appears suitable to this climate; flannel should be worn next the skin. Cholera belts, already supplied, should be invariably worn. Drills are carried on during the dry season, and at such hours as to prevent unnecessary exposure to the sun. The most healthy months are from November to the end of February, the most unhealthy from May to the end of August. The prevailing diseases are fevers and bowel complaints. There is no district near the station which is likely to be more conducive to health.

5. I have served in India, at Bangalore, Kurnool, Hyderabad, Samulcottah, Rajah Mundry, Condapilly, Masulipatam, and Rajapore; in Burmah, at Rangoon, Prome, Nunyan; inland, Padong myo, Thyet-myo, and inland and at Tonghoo; I have also resided for brief periods at Sittang, Shoay ghein, Moulmein, Henzadee, and Ava. In India, Condapilly was the most sickly, and in Burmah, Nunyan, Shoay ghein, and Mendoon inland from Thyet-myo, appear the worst; whilst Tonghoo and Enghma, inland from Prome, appear to be the most healthy.

III. SANITARY CONDITION OF STATION.

1, 2, 3. A plan of the cantonment is forwarded, but it was not thought necessary to include the four miles of the surrounding country, as it is all jungle with a few paddy fields here and there.

4. Table of Barrack Accommodation.

Date of construction of barracks; European infantry, 1857-58; European artillery, 1855.

Total number of rooms or huts; European infantry, 20; European artillery, 4.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Bed above the Floor.	Windows. Number	Height.	Width.
20 Half Company European Infantry Barracks.	50	143	46	$17\frac{1}{2}$	115,115	2,302	131	2′ 6″	24	4	4
4 Half Company European Artillery Barracks.	40	120	20	$14\frac{1}{2}$	34,800	870	60	2′ 6″	16	3	3
Guard Room :—											
Infantry - -	—	40	30	16	19,200	—	—	—	6	5	$3\frac{3}{4}$
Artillery - -	7	20	20	$15\frac{3}{4}$	6,300	900	57	2′ 6″	4	3	3
Prison Cells :—											
European Infantry											
2 each - -	—	20	20	$18\frac{3}{4}$	7,500	—	—	—	3	2	2
2 each - -	—	10	10	13	1,300						
European Artillery											
1 each - -	—	20	20	$15\frac{3}{4}$	6,300	—	—	—	4	2	2
2 each - -	—	20	$9\frac{1}{2}$	$15\frac{3}{4}$	2,992	—	—	—	2	2	2

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. Each barrack has on all sides of it glass windows, which open outwards. The European barracks have an open verandah, 12 feet broad, all round them. The artillery and native barracks are not so good, and have smaller verandahs with corner rooms for non-commissioned officers; the verandah is never occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils. 6. The bedsteads are most uncomfortable, being either of iron or boarded; the former have mattresses allowed for them, but none have been granted for the latter, although they have been applied for upwards of a year; they are most necessary for the health and comfort of the men. 7. The tents are Madras European of the following dimensions, 14 ft. × 21 ft., with 2 standing poles 10 feet 3 inches high to caps inside, and having walls 5 feet high, supported with bamboos, and long enough to form porches to doors front and rear, for which there are 4 small poles; there is also a ridge pole to keep the fly sufficiently off the shell. Superficial area per man, 11 feet 9 inch $\frac{3}{25}$. To contain 25 men each :— Cubic space / Contents in feet } 1,996 nearly. 8. In barracks the means of ventilation are,—by ventilating boards at the top of the floor; by the doors and windows; and by a space left between the roofs and walls. In guard-rooms nearly the same; the ventilation is ample for the purification of the air night and day. There are no means of cooling the air in barrack rooms as yet; punkahs have been applied for. 9. The barracks and all places of abode are built of wood. The natives have barracks with mat walls plastered and whitewashed. 10. The floors are constructed of wood. The floors of the European infantry barracks are raised 7 feet above the ground; those of the artillery and native barracks about 3 feet. There is a free passage of air beneath. 11. The materials used in the construction of the barracks, huts, and tents, are suitable to the climate; they are very salubrious. The public buildings, however, should be either shingled or tiled, as at present they run a great risk of being burnt down. All public buildings and cantonments are kept in repair by the executive engineer, and sanctioned works are speedily executed. The senior surgeon is responsible for the sanitary state of the cantonment. The walls and ceilings of barracks are always kept perfectly clean; they are not whitewashed, being built of wood. 12. There are ten wash-houses for the men, built of wood, one to each company, supplied with water by bheesties. 13. The barrack cook-houses are temporary buildings, and in a very bad and dangerous state; the means of cooking are ample, and the water supply sufficient. The drainage is imperfect. The roofs are thatched, and there is no ventilation ridge for the escape of smoke; one was burnt down a few days ago. The linen is washed by dhobies, kept expressly for that purpose; they are sufficient for the wants of the station. 14. The privies are temporary buildings, and very bad, the soil passes into a cesspool; there are no means of cleaning them out, they are purified by pounded charcoal and lime. Urinals have not yet been erected. 15. The ventilation of these buildings is ample, and the means used for that purpose are the same as those employed in the barracks; they are not lighted at night time. Being a long way off from the barracks they are very inconvenient. The barracks are lighted at night by means of lanterns suspended from the tie beam. 16. The drainage of the barracks is natural; no sewers are required. Each barrack is surrounded by a drain to carry off the rain water falling from the roof; the drainage of the bath houses requires improvement, that of all the other buildings is ample. There are no women's wash-houses yet, the families of the European infantry not having arrived. No part of the barracks or hospital is damp, being well raised off the ground; all water is carried away by the natural drainage to the lower ground beyond the cantonment. There are no cesspits except those attached to the privies, which are about 100 yards distant from the barracks, and not placed near any well. There are no foul ditches. 17. No surface cleansing is required in the cantonment beyond occasional sweeping about the barracks and carting away of the refuse, for which means are placed at the quartermaster's disposal. 18. The surface of the cantonment is not yet free of vegetation. The jungle is being cleared, and a proposition has been made to Government to keep the surface free from undergrowth. The removal of the jungle will improve the ventilation, but if allowed to increase it may seriously affect the health of the troops. There are no old walls, thick hedges, &c. 19. There is at present no cantonment bazaar, but a temporary one will shortly be erected The condition of the Burmese huts in the vicinity of the station is good, those of the native followers, especially those of the artillery living within their lines, are very bad and dangerous; they are also objectionable on the score of health, and ought to be pulled down as soon as possible. Quarters should be built for all native camp followers apart from the rest of the cantonments; their pay being very small they cannot afford to build for themselves, and living in wretched huts get ill. The barracks of European infantry are free from all nuisances, but not so those of the artillery, which are close to the huts, as stated above; were they removed, and a barrack built, the nuisance would at once cease (this barrack has been since built). The commissariat bearers are particularly badly off, drawing only 7 rs. a month. They cannot build; and live anywhere and any how. Numbers are always sick, and numbers die or have to be sent away. 20. The animals for consumption are slaughtered in a slaughter-house, situated on a rising ground, half a mile east of the cantonments: the offal is sold to a Burman, who removes it daily. No nuisance is experienced from the condition of the slaughter-house. 21. There are no bazaar horses. 22. The stables for the artillery horses are most commodious, and are built of wood and thatched. They are well lighted and ventilated, owing to the height of the building and the sides lifting up and down. They are well removed from the barracks and hospital. There are no dung-heaps, the manure being thrown away at a safe distance. The horses are picketed immediately in front and rear of their stables. 23. The quarters for the married men of the artillery are bad, and not sufficiently roomy. No other married men's quarters are yet erected, but their construction has been sanctioned.

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References to Subjects and Queries.	REPLIES.
Officers' Quarters.	1. There are no public quarters for officers, each lives in a building erected at his own expense. Their sanitary condition is good. No improvements are suggested.
IV. HEALTH OF THE TROOPS.	1, 2, 3. The station is healthy; the adjoining native population are liable to intermittent fever, and consequent spleen disease. The presence of fever amongst them is ascribable to the marshy and jungly nature of the surrounding district. 4. The 69th Regiment arrived at Tonghoo from Plymouth on the 24th February 1858. They left the latter station on the 17th November 1857, after a residence there of six months, having returned in May of the same year from 10 years' foreign service, six of which had been passed in the West Indies (Windward Islands); their health in the West Indies was good, but while there they suffered much from three epidemics of yellow fever and one of cholera. Their state of health on arrival at Tonghoo was good, and has remained so ever since. They have chiefly suffered from fevers and bowel complaints, the mortality is trifling. 5. The troops are never camped out. 6 to 13, 15, 16. No experience of hill stations. 14. A frequent change of stations in the plains is beneficial. 17. See E. O'Reilly's, Esq., report (Topography, 2). 18. With regard to the healthiness or unhealthiness of particular classes of surface and subsoil for stations, no general rule can be laid down, as much depends on local influences. Preference is given to light sandy soil. 19. Soldiers proceeding to India should be about 22 years of age, and should land there about November. The troops on arrival here were at once marched into barracks; their India kit had been previously issued at Madras, and they at once entered on the usual duties of the post. On recruits first landing they should avoid exposure to the sun, and over indulgence of all kinds, and the wearing of flannel waistcoats or cholera belts should be made compulsory. 20. Soldiers should be sent direct from the home depôts to India. In order to diminish the dangers of the earlier years of service, attention should be paid to the season of their arrival; and they might then be sent at once to any healthy station on the plains. 21. Troops are transported to Tonghoo from the coast in native boats, up the Sittang river. During their transport their health is excellent. 22. Ten years is the period a British soldier should serve in India. 23. The manner of conducting the business of the medical boards, as regards invaliding, appears to answer, with the exception of the anomaly, that an appeal from such medical boards may be made to boards composed solely of field officers, which is likely to produce a conflict of opinion. 24. Invalids should leave India for home in February, at the conclusion of the cold season.
Diseases.	1. There are health inspections weekly at the station for the discovery of incipient diseases. 2. Scorbutic disease is unknown at the station. 3. Hepatic disease is infrequent; it rarely occurs in an acute form. 4. Dracunculus is not known as a disease at this station. 5. Venereal disease is of very rare occurrence. The establishment of lock hospitals would be advantageous to the health of the army. 6. No epidemics occur at the station. The prevailing diseases are fever (both intermittent and remittent) and dysentery. Cholera among Europeans is unknown, but sporadic cases occur among the native population. Small-pox occasionally rages as an epidemic among the native population. Rheumatism—occasional severe cases. The mortality for the last two years at the head-quarters of Her Majesty's 69th Regiment has been about one per cent. as regards strength. 7, 8. The more frequent zymotic diseases are remittent fever, ague, rheumatism, dysentery, diarrhœa, secondary syphilis, itch, tape and round worm. Fever and diarrhœa prevail about May, June, July, and August; dysentery, in its more severe form, about November and December. The increase in the number treated under fever and diarrhœa may be ascribed to the close damp weather then prevailing; dysentery, in its aggravated form, to the sudden decrease and change of temperature towards the end of the year. There are no localities particularly obnoxious to this class of diseases, nor can any predisposing causes to them be ascribed to any personal habits or condition of the troops. 9, 10. Small doses of quinine have not been tried as a prophylactic against malarial diseases at this station.
V. INTEMPERANCE.	1. The troops at this station are unusually temperate. There are no confirmed drunkards. 2. The proportion of admissions from diseases occasioned by intemperance is so trifling as to be inappreciable. There are no total abstinence men among the European troops. The sickness, mortality, and crime occasioned by intemperance are so trifling that no statistical table of any value can be drawn out. Drunkenness is always punished as a crime. 3. Distilled spirits are sold both at the canteen and the bazaar, but in the latter under severe police restrictions. Each man can get, on payment, out of the canteen one dram of arrack and a quart of malt liquor, or in lieu thereof two drams of arrack; both are of good quality. Spirit is not given as part of the ration; they have to pay for it at the station, on march, and in the field. The canteen is not open until after parade; soldiers cannot, therefore, obtain a dram before morning parade. It is not beneficial for them. Spirit is never given as a ration to convalescents. No deleterious drinks other than intoxicating drinks are sold at the canteen or bazaar. 4. The quantity of spirits drawn by each man is considered conducive to health and discipline. 5. Spirit is not issued as a ration. Further restriction with regard to it than that already exercised is considered unnecessary. 6. If the canteen should be restricted to the sale of either spirits, wine, or beer solely, beer would be preferable, but the use of spirits is recommended. 7. Tea and coffee are much used at the station, but lemonade and soda water are not procurable by the men. With regard to their influence on health, efficiency, &c., total abstinence is not considered beneficial to health. 8, 9, 10. The suppression of the sale of spirits in the canteen is not recommended.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	11. The canteen regulations are too voluminous to be transcribed here; they are compiled from general orders issued from time to time. The following are the chief canteen regulations :— Hours during which the canteen is open for sale of liquors :— Open at 12 noon for the issue of malt for the guard and mess tables. Open from 1 to 3 o'clock p.m. for malt and spirits. Open from 5½ p.m. to gun-fire for ditto. One serjeant and 1 corporal on duty in the canteen during the above hours. Daily allowance per man :— Malt, 1 imperial quart. } Or 2 drams of arrack. Arrack, 1 dram. }
VI. Diet.	1. The ration for Queen's troops and European troops in the Indian army is the same, and is as follows :—

	lb.	oz.
Bread	1	0
Meat	1	0
Rice	0	4
Sugar	0	2½
Tea	0	0⅝
Salt	0	1
Vegetables	1	0

3 lbs. of firewood is also allowed to each man. 1⅜ ozs. of coffee is sometimes used instead of ⅝ oz. tea to each man.

It is not considered necessary to make any periodical changes in this or any other portion of the rations. The officers of the day and quartermaster inspect the rations.

2. A complete ration, including vegetables, is provided for troops, the stoppage being 3 annas 4 pice per diem. The soldier has breakfast at 8 a.m., dinner at 1 p.m., and supper at 4½ p.m. One pound of vegetables to each man is part of the ration.
3. The rations for the Europeans are ample and good, those for the natives might be improved by the addition of animal or other solid food. No instance of the sale of rations is known. Certain men are detailed to look after the cooks.
4. Cooking is performed in large pots by native cooks. The cook-houses are temporary and very bad; they are kept as clean as such wretched buildings can be. The water supply is sufficient. The food is properly cooked and varied. It is sometimes boiled, and at other times roasted or curried. The men have coffee before a march.
5. Gardens for the cultivation of vegetables by the soldiers could be advantageously established, but the wells would have to be dug.

VII. Dress, Accoutrements, and Duties.	1. The dress and accoutrements of the soldiers at the station are according to regulations. They are suitable to the climate; but an addition of serge trousers in the monsoon would be an improvement. Nothing can be better than the present dress of the 69th. It is khakee during the day, and a serge tunic by night for guards. The guards are protected from the sun and damp by having good guard-rooms surrounded with verandahs, under which the sentry is posted.
Duties.	1. Men should be thoroughly drilled at home before being sent out to India. 2. The usual routine of a soldier's duties is as follows :— The rouse sounds at 5 a.m. *Occupation* :—Cleaning, washing, and getting ready for morning parade at 6¼ a.m. Guard mounting, inspection of arms, &c. until 7 a.m. Breakfast 8 a.m., and afterwards cleaning arms, &c. until 11 a.m. Dinner at 1 p.m., and afterwards mending clothes, &c., and reading in temperance library. School from 9 to 11 a.m., and from 2½ to 3½ p.m. Supper meal at 4 p.m. The best hours for drills in the warm weather are from 5 a.m. to 7 a.m.; in the cold weather, mornings and evenings. The average number of nights the men have in bed is five. 3. Guards are mounted close to their own barracks, and last as a rule for 24 hours. A few are reinforced and mount at retreat beating, and are relieved at reveille. There are roll-calls by day, and occasionally check roll-calls by night. The health of the troops is not affected, apparently, by night guards.
VIII. Instruction and Recreation.	1. The following are the means of recreation and instruction. There are no ball courts or skittle grounds. There is a school conducted by a serjeant of the regiment. A barrack room is used at present as a library and reading room. There are no soldiers' clubs. The men amongst themselves grow a few small vegetables—the artillery have none. There are no workshops, but there is a theatre erected by the men themselves. A small gymnasium has lately been commenced by the executive engineer, but it is not yet sanctioned. A larger one is recommended. Were all the above erected there would be ample amusement for the men, but as yet they have little or none afforded them of any kind. The men are restricted from exposure to the sun and rain out of barracks when off duty and with benefit to health. 2. It is strongly recommended that the men be supplied with the means of playing cricket, with quoits, boxing gloves, and spare ammunition for rifle matches among themselves. 3. A soldiers' savings' bank already exists. 4. There is sufficient space for the men to amuse themselves under their barracks during the day.
IX. Military Prisons.	1. There are no military prisons built yet.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2. With regard to the practical working of the powers of the medical officers in reference to the conduct of the line of march, &c. there never has been any marching of troops to or from Tonghoo. Troops are brought here and leave again in boats. 3. No camps exist in the station, and there are no regulations. 4. The arrangements adopted in the presidency for field hospitals are as follows :— Hospitals are furnished in garrison and in the field with supplies and medical comforts by the commissariat department. Each entire European regiment in garrison and in the

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References to Subjects and Queries.	REPLIES.
X. Field Service—*cont.*	field is allowed a native purveyor and an assistant purveyor, who are attached to the hospital, under the orders of the medical officer, and under the supervision of the commanding officer of the force. The hospitals of European regiments on the line of march and in the field are furnished with sick carts drawn by bullocks, and bearers with doolies and muncheels. A field medicine chest is carried by dooly bearers. The hospitals of native regiments on the line of march and on the field are furnished with sick carts, drawn by bullocks, or in lieu of them by bullocks or tattoos, and doolies and muncheels carried by dooly bearers. Also a field medicine chest carried by dooly bearers. Large supplies of medicines or reserve supplies on the line of march and in the field, either for European or native troops, are carried in bullock bandies. Rules regarding the carriage for European and native hospitals on the line of march and in the field are laid down in the general orders of the Madras presidency in the printed code of regulations, of the quartermaster general's department of the Madras army, and the printed code of medical regulations of the Madras army. All military and medical officers serving in the Madras Presidency are guided by these rules.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. No information under this head.
XII. HOSPITALS.	1. No regular hospital is yet built for the European infantry, two barracks are used for that purpose. The artillery and native infantry have hospitals similar to their own barracks. 2, 3. Hospitals form the extremity of the barracks, being part of them. The site is well ventilated and healthy. The water supply is abundant and wholesome. 4. There is no refuse water or other impurities near the hospital. The drainage is the same as for the rest of the barracks. 5. The height of the lowest ward above the ground is 7 feet. There is a free perflation of air underneath the floors. There is a drain all round the building which carries off the roof water. The drainage, construction, materials, windows, ventilation, supply of verandahs, &c. is the same as the barracks. The roof and walls are sufficiently thick to keep the hospital cool. The verandahs are never used for the accommodation of sick or others. The building consists of one flat. Table of accommodation:— Date of construction, 1857–58. Total number of wards, 5.* Total regulation number of beds, 83.

Wards or Hospital Hut, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
Two blocks of the Barrack Buildings	42	143	46	17½	115,115	2,302	131	Ft. In. 2 6	24	4	4

* Five wards are returned; three of these are rooms about 15 by 12 feet, built off from the larger rooms.

The part of the barracks used as hospitals, in common with the remainder of those buildings, are not placed so as to receive the full benefit of the prevailing winds, as the barracks are not built as they ought to be, *en echelon*.

6. The ventilation of the wards is sufficient; there are no jalousies or jhilmils.
7. There are no means of cooling the air admitted to the wards. Punkahs will be shortly erected.
8. No means of warming the wards are required. The walls and ceilings are constantly kept clean, they are of wood, and are not whitewashed.
9. The hospital privies are temporary buildings; the refuse is removed twice a day; the accommodation is not good, they are situated close to the hospital, but are not offensive.
10. Temporary wash-houses are built close to the hospital, and are sufficient for the sick.
11. Tubs filled with water are used for bathing the sick, and the means are sufficient for that purpose.
12. Dhobies wash and dry the hospital linen, and are sufficient for the requirements of the hospital.
13. The storage is sufficient and dry.
14. Cots made of wood with rattan or tape bottoms are in use in the hospital, and are considered good.
15. A good cook-house has recently been completed; the walls are of mat, plastered; the roof shingled, with ventilation ridge. There is a good brick range sufficient for all purposes. The ventilation is ample; its position is close to the hospital. The cooking of diets is properly done, and sufficiently varied.
16. Diet rolls, &c., according to regulations.
17. The provision for attendance on the sick is that laid down in the Madras medical code, and is sufficient.
18, 19. The sanitary condition of the hospital is good. There have been no cases of hospital gangrene, pyæmia, or anything of an epidemic character. Nothing to suggest in the way of improvement.
20. The convalescents are plentifully supplied with seats, and have ample space for exercise under the hospital buildings.
21. No arrangement has yet been made for the treatment of soldiers' sick wives and children.
22. There are no special local hospital regulations not included in the general presidency medical regulations.
23. The medical officers have every necessary power in matters appertaining to the sanitary state of the hospital, &c.
24. Soldiers when discharged from hospital are generally allowed to be convalescents in barracks for some days, this is considered preferable to having any distinct convalescent hospital.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1, 2. The old burial ground has been given up, and a new one chosen well away to leeward of the rest of the inhabited portion of the cantonment; its area is 300 by 200 feet. The sub-soil is compact red sand; the drainage is natural. The ground is not yet completed. 3, 4. So few deaths have occurred, and so much space is available, that a large interval is left between the graves; the depth of graves is generally 6 feet. They are never re-opened, and there is never more than one body buried in the same grave. Interment is compulsory 24 hours after death, sometimes less. The Burmese burn their dead; the natives either burn them or bury them a long way off in the jungle. No one has been buried in the new graveyard; British troops are buried according to regulation. 5, 6, 7. The dead of camp followers and bazaar people are generally burnt or buried a long way off in the jungle. No injury to public health accrues from the present practice. No improvements are suggested.

(Signed) J. F. G. Campbell, Brigadier, Commanding Tonghoo.
Huntly Geo. Gordon, M.D., Surgeon 69th Regiment, H.M. Bn., Senior Surgeon.

17th March 1860.

Executive engineer absent from the station, signature not obtainable.

SHWAY GHEEN, MARTABAN, PROVINCE BURMAH.

Accommodation - Queen's Troops - Artillery - - - 24; Infantry - - - 200
Native Troops - Infantry, Pegu Police - 600

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country, except in a south-westerly direction, in which the town lies, is all jungle. North, east, and south, hilly; mountains to the east, distant from 15 to 20 miles; north-west, west, and south-west, flat, low, and from June to November, either lake or swamp. Wood, jungle, and water in great quantities. 2. The elevation of the station above the sea is about 125 feet. To the east and south-east, the country is of nearly the same level as the cantonment. In all the other directions, as the country is flooded during the monsoon, and the tide extends many miles above this, the station may be about 80 feet above the general level. In the dry season, the nearest waters are those of the Sittary and Shway Gheen rivers, about equi-distant (three-quarters of a mile) from the station. During the monsoon, the inundations extend to the foot of the high grounds on which the station is built, and about 500 yards from the European barracks. There is no higher or healthier ground adjoining the station. 3. There are mountains about 15 or 20 miles distant, but no table land. The height of these mountains is about 5,000 feet. 4. The nearest waters are the Sittary and Shway Gheen rivers, about three-quarters of a mile from the station. During the monsoon, there are two streams which form the boundary of the cantonment. They flow from June till January. From the end of June till the end of October, the town and country to the westward is flooded. There is no broken ground, nor any ravines or water-pits near the station. 5. The station is perfectly open and quite free from all obstacles to external and internal ventilation. The construction of the houses does not admit of their becoming heated, being made of wood, and by no means crowded. The station being higher than most of the surrounding country, must be exposed to all winds. The sea breeze is occasionally felt. The health of the troops does not seem to be affected by the winds. 6. The surrounding country is uncultivated. There are no works of irrigation near the station. The cultivation of rice is not prohibited within certain limits. Indigo is not cultivated, nor is the preparation of hemp or flax carried on near the station. 7. The town of Shway Gheen lies about a mile from the cantonment. 8. The cantonment stands upon a gravel and laterite formation, the subsoil of the district varies greatly, but is generally covered with dense jungle. The station occupies new ground from which the jungle was cleared. 9. No wells have been sunk. 10. The rain-fall runs off easily, and does not lie on the surface anywhere in the cantonment No drainage from any higher level passes into the subsoil of the station.

SHWAY GHEEN, MARTABAN, PROVINCE BURMAH.

MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	11. The water supply of the station is derived from the Shway Gheen river. It is not stored in open tanks, there being none within the vicinity of the station.
	12. The river supplying the station flows perennially, and the water is clear, tasteless, and odourless, the quality is decidedly good, and not injurious to health. Water carts are used for the Europeans. No better arrangements could be made for the water supply.
	13. There is an extent of jungle to the north-west and west, which commences immediately beyond military limits, and extends to the left bank of the Sittary river. This was formerly cut down, but never rooted up. It has now grown up more dense than ever; and as during the monsoon it is a deep swamp, with 10 and 12 feet of water over it, I consider it by no means improbable that this jungle swamp does influence the health of the troops occupying this station.
	14. The conveniences of wood and water being found, the rest of the selection as to topography, climate, diseases, sanitary condition, &c., for new stations, is left to chance. With reference to this country, the Burmans say that Burman mud is wholesome, and Burman hills unhealthy for a location, and there certainly appears some truth in these conclusions. At the same time, provided high ground was procurable in the vicinity, like this on which Shway Gheen stands, I would never suggest that the cantonment should be formed on the bank of a river which is annually flooded.
II. CLIMATE,	1. There are no instruments available at the station for conducting and registering meteorological observations.
	3. The climate is dry only during the months of February (the latter part), March, April, and the early part of May. It is very damp during the rest of the year, and being never very hot nor very cold the variability is not great. Fogs are rare. It is merely from the roads that any dust is raised, but during the dry months above mentioned the air is loaded with smoke and particles of burnt matter, from the jungles being on fire on all sides. But this does not seem to affect the troops in any way. The climate is unhealthy. Diet should be generous. Shelter from the sun, wind, and rain are precautions that should always be attended to. Clothing must be varied according to season. Drill and exercise should invariably take place in the morning, and decidedly at this station they are very objectionable in the evenings. The hot months are the most healthy both for Europeans and natives. The rains and cold months are the most unhealthy. Fevers and diseases of the bowels are the prevailing diseases.
	4. The station of Sittang, distant about 40 miles, appears to be more healthy than this. It is not quite so high above sea level. The drainage is not superior to this. The water is procured from wells. Its being more healthy is unaccountable, as the jungle is more dense than that around here, and approaches very much closer to the station. The high ground is much too limited for adoption, except for a very small force.
	5. The following is a list of stations on which I have served, and their comparative salubrity:— Palaveram, Merkara, Cannanore, Madras, Secunderabad, Samulcottah, Waltair, Vizianagrum, Shway Gheen, Tonghoo, and Rangoon. *Palaveram* is a very healthy station and remarkable for the absence of cholera, which rages around but never enters the cantonment. *Merkara* in Coorg, situated at an elevation of 4,763 feet above sea level, was an extremely healthy station, both for Europeans and natives. *Cannanore*, on the western coast of the peninsula, is a damp but on the whole not an unhealthy station. If during the monsoon, which lasts from June to 15th September, there happen to be several consecutive days without rain, cholera was sure to make its appearance. At *Madras* my corps occupied the Perambore lines, which in those days (1843) were low, swampy, and unhealthy. Cholera was a never-absent disease, and was particularly prevalent during the cold months. My corps has since occupied the Vepery lines at Madras, and these are positively injurious to health; they were condemned 13 years since, yet still the low marshy and unhealthy ground continues to be occupied by a regiment of native infantry. *Secunderabad* was very unhealthy during the time my corps was stationed there, but the locality had a great deal to do with this, though in an unaccountable manner. At *Samulcottah* there were 42 cases of admission on the sick report of European officers, and nearly 3,000 of natives, of a regiment numbering about 12 of the former and 700 of the latter. The mortality also amongst the latter was very great; but this amount of sickness was principally owing to the employment of the corps in the unhealthy jungles of Golcondah. *Waltair* is a healthy station, except during the months of October, November, and December, when fevers are prevalent. The situation of the lines entirely excludes the occupants from the benefits of the sea breeze. *Vizianagrum* is both a healthy and a favourite station, although exceedingly hot. *Shway Gheen.* During my first occupation of this station, in March 1854, the whole of the troops were located inside the stockade, and the jungle was still standing on the ground where the cantonment now stands. The Europeans consisted of two companies of H.M.'s 29th, a detachment of Madras artillery, and a wing of the 36th Regiment Madras native infantry formed the garrison. The Europeans were on the whole healthy, but they occasionally suffered from a fever, which Assistant-Surgeon Macqueen, in medical charge of the station, said was of a type common in some of the districts of France. He termed it a gastric fever. It was very fatal. *Tonghoo*, I found a far more healthy station then either Shway Gheen or Rangoon. *Rangoon.* At this latter place I lost a large proportion of men, considering how short a time my corps was stationed there. In my opinion the natives of India certainly become acclimatized to Burmah, and suffer less and less each succeeding year.
III. SANITARY CONDITION OF STATION.	1. The executive engineer of this district being ill and confined to his bed, most of the questions under this head must remain unanswered.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	4. Table of Barrack Accommodation. Date of construction, 1855 and 1856; and within stockade, 1853. Total number of rooms or huts. { 4 barracks for European infantry. 1 barrack for artillery Total regulation number of N.C. officers and men. { 200 European infantry. 26 European artillery.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
5	50	120	20	14							
1	26	90	20	14							
Guard Room - -	10 natives.	20	20	14							
Prison Cells - -	1	15	15	10							

5. The barrack windows are on opposite sides and open inwards. There are verandahs on one side of the European infantry barracks, and a verandah all round the artillery barracks. The verandah is never occupied for sleeping purposes by soldiers or other persons. There are no jalousies or jhilmils.

6. Trestle bedsteads are used, and the bedding consists of cotton razai and blankets.

7. The troops are not encamped in this country.

8. The ventilation is effected by means of doors and windows, and a ventilating board, one foot broad running along one side of the barracks at the height of the floor; *i.e.*, with its lower edge at the same level as the floor. The air is kept sufficiently pure by these means night and day. No means are used for cooling the air of barrack rooms.

9, 10, 11. The four European infantry barracks are constructed of wood. The walls and floor are planked, and the roof tiled. The one for the European artillery is similar, except the roof, which is thatched. The planked floors are raised about 3½ feet from the ground. The materials cannot be improved upon, but the construction certainly can.

The barracks are kept in repair by the executive engineer. The repairs, unless requiring reference, are quickly executed. The commanding officer is responsible for the sanitary state of the cantonment so far that he calls on the executive engineer for the execution of works required. There are no stated times for the cleansing and whitewashing of the barracks, but it is done when required.

12. There are no baths, washing tubs are used, for which the water is brought in carts. The drainage is open and good.

13. The cook-houses are in a state of dangerous decay; there are 6 coppers and four native cooks to each company. The water is brought in carts, and the drainage is open.

There are no conveniences for washing and drying linen.

14. Cesspools are being sunk for the purpose of removing the contents of the privies and urinals.

15. The barracks are lighted by means of lamps slung from beams.

16. An open drain runs all round the barracks, leading into the road ditch, and this carries off the water into the low ground. There are no sewers or covered drains, but the drainage is quite sufficient. There is no dampness in any part of the barrack or hospital. There are no foul ditches.

17. The surface cleansing is effected by annually burning the grass, &c.

18. The surface of the cantonment is annually freed from vegetation.

There are neither walls nor hedges at this station.

19. There is no military bazaar at this station, nor are there any native houses anywhere near. No nuisance is consequently experienced in barracks from wind blowing over them.

20. The slaughter-house used to be in a position which, although outside the cantonment, was to the windward of it as regards the prevailing wind. It has been removed, and, though within the limits of the station, it is so far (about a mile) from the European barracks, and so situated, namely, in a hollow, that no nuisance whatever is experienced from it.

21, 22. There are no bazaar horses.

23. There is no proper accommodation for married men at this station. Two temporary buildings have been run up, but they are utterly unfit for the purpose required.

Officers' Quarters.

1. At this station officers have built their own houses. They appear to be healthy; the drainage is good, and the ventilation more than sufficient, as must be always the case in wooden buildings with mat walls. No improvements are suggested in them.

IV. Health of the Troops.

1. The station is not considered a healthy one. The district is very thinly populated, except along the banks of the rivers. The native population suffers from fevers in the town of Shway Gheen, but are generally strong and healthy.

2. The prevalent diseases are fevers, small-pox, and cholera, but the latter does not prevail to any great extent, not as in India.

Shway Gheen Martaban, Province Burmah. Madras.	References to Subjects and Queries.	Replies.
	IV. Health of the Troops —*cont.*	3. The healthiness of the native population is to be attributed to their living on the banks of rivers, where there is no malaria. Their unhealthiness, as far as fever is concerned, to their proceeding into the hilly districts for the purposes of traffic. 4. The following are the stations, with their influence on health, at which the troops were before coming to this station:—The detachment H.M.'s 69th Regiment has just arrived from Thounghoo; and that of the Madras artillery from Secunderabad. The Pegu police battalion was raised at Palaveram during the early part of 1858; they embarked on the 6th September of the same year, and arrived here on the 24th of the same month. Very healthy, both at Palaveram and on arrival here, but since then the battalion has suffered much from fever, diarrhœa, and dysentery. No part of the present accommodation for troops is more unhealthy than the rest. 5. The troops are not camped out. 6. With reference to experience of the healthiness of hill stations; I was adjutant of my regiment at Merkara, which being 4,762 feet above sea level, may be termed a hill station. The health of both Europeans and natives was better, and the mortality much less than at any station at which I have been located. 7. No opportunity of judging whether troops long resident on hill stations are more liable to attacks of febrile and other diseases on returning to the plains, but should say decidedly not. 8. Such localities as the Western Ghauts and Neilgherries are decidedly favourable as stations for troops, particularly European troops. 9, 10. Diarrhœa is a very common complaint on first going to the Neilgherries. The best precaution is a flannel belt. 11. The Neilgherries and Western Ghauts are adapted for residence during the whole year. The full benefit of such a residence could not be felt under two years. 12. No experience of the period of residence beyond which injury is likely to be inflicted on the troops on returning to service in the plains. 13. The precautions required in leaving hill stations are to guard against exposure to the sun as much as possible, and to reduce the amount of clothing according to the increase of temperature. 14. Residence at the hill stations to which my experience goes, is much the same as what would be felt, as far as climate is concerned, in the warmer counties of England, and therefore there can be no question that location on the hills would much longer preserve the vigour of the European. But how far a long residence on the hills would render a soldier more apt to contract the diseases of the plains I cannot say. "Short periods," if by that is intended less than two years, would not be beneficial or conducive to the health of troops in general. Doubtless change of station, as well as change of scene, is beneficial to convalescents. 15. No experience of barracks or hospital accommodation at hill stations. 16. The most suitable height for hill stations, even within the tropics, must in a great measure depend upon the degree of latitude. In the Madras presidency I consider about 5,000 or 6,000 feet above sea level the most suitable. 17. Ranges of hills of great height, said to be upwards of 8,000 feet in height, are to the N.E. of this station, but I do not know this of my own knowledge. They must be about 100 miles from this. My informant, the former Deputy Commissioner of Tonghoo, found ice there late in February; these hills should be examined to see if they are fit and could be advantageously occupied as a hill station. 18. With reference to the class of surface and soil for stations, Burmah is decidedly an exception to the general rule—muddy soil, like that of Tonghoo, being healthy, and a gravelly and laterite soil, like Shway Gheen, being unhealthy. 19. In considering the best age at which to send soldiers to India, much depends upon the natural conformation of the man. As a general rule about 19 or 20; they should arrive in October. No knowledge of the disposal of troops on first landing. To preserve the health of recruits on first landing they should be kept out of the arrack shop; as much as possible out of the sun; should have dry feet; and a flannel belt or cummerbund round the stomach. 20. Cannot say whether troops should be sent from home depôts to India, or to an intermediate station for a certain time. Sending them in the first place to a hill station would doubtless be a beneficial measure. 21. Know nothing of the transport of troops to the interior. 22. The British soldier seems to wear out very fast in India, and is considered an old man after 15 years' service. I think a British soldier might serve very well for 20 years, and I would suggest this period being divided thus:—His first 4 years at a hill station, the next 10 years on the plains, and the remaining 6 years on the hills. 23. In matters relating to invaliding, the captain of a man's company, who has seen him for years and knows all about him, is in my opinion a far better judge than a committee which sees him only for five minutes. But how to avoid conflicting opinions seems to me utterly impossible. 24. Invalids proceeding home by sailing vessels should leave in January or February.
	Diseases.	1. Inspections for the discovery of diseases take place on Saturdays. 2. There have been no cases of scorbutus or scorbutic disease. 3. About one-fourth have been afflicted with hepatic disease. The causes are variable; generally the consequence of fevers. Not aware of any prophylactic measures which would diminish its frequency. 4. Dracunculus is unknown here. 5. Amongst the European soldiery venereal disease is unknown; amongst natives the proportion is about one-half per cent. There can be no question of the advantage of re-establishing lock hospitals. 6. The epidemic and endemic diseases are,— *Fevers.*—Remittent, intermittent, and continued. *Cholera.*—None. *Small-pox.*—None. *Rheumatism.*—Infrequent.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	Table showing the admissions and deaths from these causes in 1859.

Date of Admissions.	Number.	Diseases.	Number of Deaths.
Total number during the year 1859	188	Fever	22
		Dysentery	2
		Cholera	0
		Small-pox	0
		Rheumatism	0

The total number of deaths during the year, 26. This includes the detachment of H.M. 69th Foot, and European artillery only.

7. The usual characters of intermittent fevers are seen here. Diseases are most prevalent during the wet and cold seasons. The atmospheric condition consequent on the changes of the different seasons precede and accompany their appearance. There are no bazaars. Not aware of any predisposing causes to these diseases.
8. Exposure during night duties is the cause of epidemic diseases among the soldiers.
9. Quinine has been tried as a prophylactic against malarial diseases, but the result was unfavourable.
10. More room should be provided in barracks for European soldiery, also some provision for them to take exercise during the day without exposure to the sun. The jungle surrounding the cantonment should be regularly cleared.

V. Intemperance.

1. The soldiers are temperate. There are no confirmed drunkards.
2. During the past year the admissions into hospital from diseases directly caused by intemperance were 5.

   The detachment H.M.'s 69th has just been relieved, therefore any statistical table would extend to about 15 days' experience. Drunkenness *per se* is punished as an offence.
3. Spirits (arrack) are sold at the canteen. The quality is good; it is supplied by the commissariat department. The probable amount consumed by each man is one dram.

   (1.) In barracks, spirit is no part of the soldier's ration. (2.) On march it is served out as such. (3.) No experience as to its being supplied as a ration in the field. No experience as to its quality and amount. Spirit is never given as a ration to convalescents. No other drinks are sold in the canteen.
4. In regard to health, difference of opinion exists as to the consumption of spirits by soldiers. I am of opinion that spirits are injurious to health. If taken in moderation there is no reason why spirits should not be conducive to discipline.
5. It would be injurious to abolish the use of spirits altogether, but beneficial to restrict it as at present, to a moderate quantum.
6. In my opinion, malt liquor and wines are far more conducive to health than spirits.
7. Coffee, tea, and ginger-beer are much used at the station. Their influence on health and discipline is far better every way than spirits, but I consider if European soldiery are required to undergo hard work, and long and fatiguing marches, malt liquor is requisite to keep up their stamina.
8. No spirit rations are issued to troops on the station.
9. It would be objectionable to prohibit the sale of spirituous liquors entirely at the canteen, because the men would procure a much more deleterious spirit in the bazaar.
10. I consider the present arrangements on these points very good.
11. The following is a copy of the Canteen regulations of H.M.'s 69th Regiment:—

    "(1.) The commissariat will supply liquor to soldiers at the rate of 1 dram of arrack and 1 quart of porter per diem, to each man; or at the option of the man, 1 pint of beer will be issued in lieu of the dram.

    "(2.) The charge for 1 quart of porter will be 3 annas, and for 1 dram of arrack an anna.

    "(3.) The canteen will be open from $1\frac{1}{4}$ till $2\frac{1}{4}$, and from 6 till 8 o'clock p.m., after which hours no liquor will be issued.

    "(4.) The canteen will be under the charge of a serjeant, who will be responsible for the regularity of the canteen, and account for the liquors under his charge. He will be allowed an European assistant.

    "(5.) A non-commissioned officer will be detailed daily, who will receive from the orderly serjeants of companies, at 12 noon daily, a list showing men in hospital, confined to barracks, and on duty, and the latter only shall be allowed 1 quart of beer."

VI. Diet

1. The following is the ration of—

	Queen's troops.	European troops of the Indian Army.
Beef	1 lb.	Not known.
Bread	1 lb.	„
Vegetables	1 lb.	„
Rice	4 oz.	„
Sugar	$2\frac{5}{7}$ oz.	„
Tea	$\frac{5}{7}$ oz.	„

And once a week, Coffee, $\frac{3}{4}$ oz. is substituted for tea.

An inspection of the rations is made daily by the orderly officer.

2. A complete ration is provided, the price of which is 3 annas 4 pice. No stoppage is made for this, except that the daily pay of a soldier is about $3\frac{1}{2}d.$ less than his gross pay in England. 1 lb. of vegetables is allowed for each man. There are 3 meals daily; breakfast at 8 a.m., dinner at 1 p.m., supper at 5 p.m.
3. Mutton twice a week would be a pleasant change for the men in lieu of the perpetual beef. The orderly corporal and the orderly man at the cookhouse are responsible that the whole of the rations issued to their company are forthcoming at meal times.
4. There are 4 native cooks to each company, and 6 coppers.

   The cookhouses are dangerously bad. The food is invariably boiled. The cookhouses, for they cannot be called kitchens, are kept clean, but are in a falling state and positively dangerous. On the march, tea, coffee, or other refreshment is provided.

SHWAY GHEEN, MARTABAN, PROVINCE BURMAH.

MADRAS.

References to Subjects and Queries.	REPLIES.
VI. Diet—*cont.*	5. A portion of ground has been set aside for cultivation since the first marking out of this cantonment in 1854, and has always gone by the name of "The Soldiers' garden," but none of the soldiers have ever turned a spade of earth in it; the reason, no doubt, being that this is merely a detachment, and that they do not remain here long enough to benefit by their labour.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The dress for European soldiery is,—1 cloth tunic, 1 pair cloth trousers, 1 woollen cap with cloth cover, 1 serge smock frock, 4 pairs of white trousers, 2 khakee jackets, 2 pairs ditto trousers, 3 pairs of worsted socks, 2 pairs of white cotton ditto, 5 white shirts, and 2 coloured ditto, 3 flannel ditto, 2 flannel belts, 1 waist-belt, 1 pouch belt, 1 40-round pouch, 1 20-round pouch, 1 knapsack and straps, 1 canteen and cover. The head dress, which fits too close, is the only objectionable part of a soldier's present dress, and this is to be altered into a wicker helmet, which will, no doubt, be a very great improvement. I think now, the soldier's dress is as nearly perfect as it can be. The present guard dress is khakee during the day, and the serge smock frock at night.
Duties.	1. It is decidedly advisable that the men should be thoroughly drilled at home before being sent to India. 2. The usual routine of soldiers' duties is,—guard once about every five days. One hour's drill in the morning from 6 to 7 a.m. Cleaning of arms and accoutrements in the middle of the day. The men do not appear to suffer in health from drill in the morning, and they certainly seemed to do so when there were evening drills. The best hours for drills or parades are from daylight to 7 a.m. For marches, at such an hour as to complete the march not later than two hours after sunrise during the hot, and three hours during the cold weather. There are general orders on this subject. The men at this station have from five to six nights in bed during the week. 3. The most distant guard is about 500 yards from the barracks. There are three roll calls by day, occasionally check roll calls by night at uncertain hours. I consider the night guards at this station very injurious to health, and all precautions have been taken already by having as few as possible.
VIII. INSTRUCTION AND RECREATION.	1. The means of recreation are as follows:—There are no ball courts, and the skittle-ground, made by the soldiers themselves, is very inferior. There are no schools or schoolmasters; no library or reading room, no day room or clubs, nor are there gardens, workshops, or gymnasia. There always had been a theatre until the arrival of the present detachment of H.M.'s 69th, but it is now pulled down. The means are not sufficient to occupy the soldier during the wet season or the heat of the day. The men of the 69th Foot are not allowed to go out in the sun after 9 a.m., nor before 4 p.m. The artillery, on the contrary, are allowed to go out at any time during the day; the result will be much better seen by reference to the returns of the Madras Fusileers and 2nd European light infantry, who enjoyed the same privilege, and apparently without any ill effects to health. 2. The means suggested for recreation and employment are a good library, two good skittle-grounds, a ball court, gymnasium, and a theatre. 3. Soldiers' savings' banks have already been established for years. 4. There are no trees in this cantonment. No sheds; and the verandahs are not sufficient for the men to take exercise in.
IX. MILITARY PRISONS.	1. There is no military prison. The cells are portions of the orderly room boarded off. They are not unhealthy.
X. FIELD SERVICE.	2, 3. Cannot say what is the practical working of the powers of medical officers in field service. No knowledge of the practical operation of camp regulations for the preservation of the health of the troops. 4. I do not know the arrangements adopted for field hospitals, &c., nor am I able to transmit copies of regulations.
XII. HOSPITALS.	1. The executive engineer being ill, no ground plan or sketch of the hospital could be procured. 2. It is distant about 150 yards from the nearest European barracks. The bazaar and civil population is far removed. The site is open and freely ventilated, and there are neither buildings, walls, nor trees to interfere with such ventilation. The site is generally healthy as to elevation, drainage, absence of malaria, &c. 3. The water supply is abundant and wholesome. 4. For mere drainage of water open drains are used, but other impurities are removed by the hospital attendants and thrown into the cesspools. 5. There is only one range of wards about four feet from the ground. Beneath the flooring it is perfectly open, and consequently there is a free passage of air. There is an open drain all round the building, from which the water readily runs off to the lower grounds. It is quite sufficient for carrying away the rain-fall. The hospital is built of wood, with tiled roof and wooden ceiling, plank walls (single) and floor. The roof and walls are sufficiently thick to keep the hospital cool. There is a verandah on one side only; on the other side the roof extends in the form of a narrow verandah, and I consider that on this side (the west) some further shelter from the sun's rays should be afforded. The verandah is not used for the accommodation of sick or others. The following table gives the accommodation:—Date of construction, 1856. Total number of wards, 2; *i.e.* the same room divided by a grating. Total regulation number of beds, 32.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area of Feet per Bed.	Height of Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
								Ft. In.		Ft. In.	Ft. In.
1	22	100	20	19	—	—	—	2 6	17	3 3	3 3
1	8	20	20	19	—	—	—	2 6			

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The hospital is so placed as to receive the benefit of prevailing winds. The windows open inwards, and a ventilating board one foot in width, opening with hinges at the level of the floor, keep the wards free from odour and closeness. There are no jalousies or jhilmils. 7, 8. There are no means of cooling the air admitted into the wards, nor means of warming the hospital. The walls and ceilings are whitewashed and cleansed upon requisition, but at no stated intervals. 9. The privies are at about 30 yards distance from the hospital; they are placed over cesspools, and are not at all offensive. 10. The lavatory arrangements consist of a bath-room, which is insufficient. 11. A bath-room about 10 feet square is the only means of bathing the sick; this is not sufficient, and a regular bath is required. 12. There are no means of washing and drying the linen attached to the hospital; it is issued as required by the commissariat department. 13. The storage is insufficient, but dry. 14. Cane-bottomed cots, straw bedding, stuffed mattrasses, and rezais and blankets are used in the hospital. No improvement is required. 15. The kitchen is situated about 30 yards from the sick wards. The means of cooking are insufficient, and diet not sufficiently varied. Apparatus for cooking consists of two coppers, one frying-pan, and a few chatties. 16. Diet tables, &c. of detachment Her Majesty's 69th, according to regulations. 17. A lance corporal of Her Majesty's 69th acts as hospital serjeant. There are no nurses. Orderlies are furnished as required. The attendance is sufficient. 18. The sanitary condition of the hospital is bad. No epidemic disease, hospital gangrene or pyæmia have shown themselves in it. 19. The hospital is altogether much too small, too low, and too narrow. A new hospital is the only suggestion that can be made. 20. No provision is made for convalescents taking exercise, nor is there ground suitably fenced, or shaded walks, or seats set apart for their use. 21. No provision is made for the treatment of soldiers' sick wives or children. The present arrangements are extremely unsatisfactory. 22. There are no special local hospital regulations. 23. The medical officer has no further powers than that of representing matters appertaining to the sanitary state of his hospital, and such representation is, of course, immediately attended to, provided it is reasonable. Change of diet and medical comforts are entirely within his own province, and in his own power to order. 24. Convalescents are sent to their barracks. A convalescent ward would be a great advantage.
XIII. Burial of the Dead.	1. The burial-ground is about 300 yards from the nearest European barracks, and nearly to windward of this last barrack. 2. It has a frontage of 120 and depth of 90 yards; soil, gravel; subsoil, hard decomposed rock, with gravel; drainage, good, being on the slope of a hill. Whether decomposition takes place readily or not it is impossible to say, as no bodies have been exhumed. The ground has not been carefully kept until now. 3. There are no regulations as to space between graves. Their depth is from 4 to 6 feet, according to whether rock is met with or not. They are never re-opened again. Interment almost invariably takes place the morning after death. There are no orders on this subject. The native Christians are buried in the same burial-ground as Europeans, other natives about a mile and a half to the northward of the cantonment. 4. The grave-yard has never been offensive. There are no regulations, that I am aware of, regarding the burial of British troops. 5. The dead of the camp followers and bazaar people are buried in the native burial-ground. 6, 7. No injury accrues to the public health from the present practice. No improvement can be suggested for the burial or disposal of the dead.

(Signed) H. W. Blake, Lieutenant-Colonel, Commanding Shway Gheen.
4th April 1860. J. J. Heffernan, Assistant Surgeon.

THYET MYO.

Civil Government that of Bengal, but Garrisoned by Madras Troops.

Accommodation -	Queen's Troops -	Artillery - -	48
		Infantry - -	310
	Native Troops -	Infantry - -	1,834

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is undulating and covered with low jungle. These are no hills of any altitude. The surface is undulating and generally dry. There is an abundance of wood, jungle, and water. 2. The elevation of the station above the sea and adjacent country is 240 feet. The nearest river is the Irrawaddy. There is no higher or healthier ground adjoining the station. 3. Three miles to the S.S.W. of the station there is a range of small hills from 200 to 400 feet high, covered with jungle. 4. The station is on the banks of the river Irrawaddy, which generally overflows in August, and the vicinity is inundated for from 10 to 12 days. A deep precipitous nullah is the northern boundary of the station, emptying itself into the river. The water carries away much rubbish and filth, and is conducive to health.

THYET MYO. MADRAS.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	5. The station is open where houses are built, but the jungle grows close up to the confines, and therefore it is not freely exposed to winds. The temperature of the station is raised by the buildings, which are almost all built of wood and bamboo mats, being exposed to reflected sun-heat. It is exposed at certain seasons to very cold winds, which may cause disease. There is no sea breeze. 6. The surrounding country is generally uncultivated; some spots reclaimed from the jungle are cultivated. There are no works of irrigation near. The cultivation of rice is not prohibited, but the tracts of ground under cultivation are very small, and some few are on the limits of the cantonment. Indigo is not cultivated, nor is the preparation of hemp or flax carried on near the station. 7. The native town of Thyet Myo is within 200 yards of the station. 8. The geological structure of the station is much varied. In some parts gravel crops up within a foot of the surface; in others, red and black earth. The subsoil consists of gravel, sand, and black mould, but there is no certain rule. The station occupies new ground. 9. Experiments recently made show the depth at which water can be found to be from 12 to 60 feet, irrespective of seasons. 10. The rain-fall does not flow very readily away in consequence of the imperfect drainage. It flows from the higher into the lower part of the cantonment, and sinks into the soil in some places; in others, it lies on the surface until it evaporates. There is no adjacent higher ground, the drainage from which passes into the subsoil of the station. 11. The water supply of the station is derived from the river Irrawaddy. There are no tanks. 12, 13. The supply of water is equal to the requirements of the station. It is a dirty white in colour, but pleasant both to taste and smell. It is soft, and full of animalculæ; its quality is good. It is brought from the river by puckallies. No better water supply could be obtained. 14. No knowledge of the mode of inquiry or examination as to topography, climate, &c. in the selection of new stations.
II. CLIMATE.	1. The meteorological instruments available at the station are an aneroid barometer, a thermometer, a wet bulb, and rain gauge. 2. The following Table shows the result of the observations made from 1st January 1859 to 31st December 1859:—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Min.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Dew, Winds, Storms, &c.
January -	29·851	70·5	36·	88·5	52·5	70·5	57·	No black bulb thermometer for ascertaining this.	—	E. & N.E.	No instrument for measuring this.	—	Clear, Fine, Fogs morning.
February -	29·855	78·5	33·	95·	62·	78·5	59·5		—	N.E.		—	Do. Do.
March -	29·810	82·4	31·7	98·3	66·6	82·4	60·		·25	N. & N.W.		—	Heat, Haze.
April - -	29·760	89·	24·	101·	77·	89·	63·7		·50	W.		—	Do.
May - -	29·700	85·3	25·7	93·2	77·5	85·3	74·8		2·25	W.		—	Cloudy, Monsoon begins about 15th.
June - -	29·590	79·6	9·3	84·2	74·9	79·6	72·		16·52	S.W.		—	Cloudy and Rainy.
July - -	29·615	81·8	9·7	86·7	77·	81·8	77·6		6·85	S.W.		—	Do. Do.
August -	29·680	82·1	9·2	86·7	77·5	82·1	77·4		9·75	S.W.		—	Do. Do.
September -	29·702	82·6	10·2	87·7	77·5	82·6	78·4		4·77	S.W.		—	Do. Do.
October -	29·739	81·4	10·4	86·6	76·2	81·4	77·		6·78	S.		—	Clouds and Rain first part of month.
November -	29·846	75·2	19·5	85·	65·5	75·2	68·9		—	S. & S.E.		—	Dense Fogs prevail in the morning.
December -	29·862	73·2	21·8	84·1	62·3	73·2	66·1		·35	E. & N.E.		—	Do. Do.
Ann. Means and Totals	29·751	80·1	20·	89·7	70·5	80·1	69·4	—	48·02	—	—	—	

	3. The character of the climate, as compared with India stations generally, is that of greater moisture of atmosphere and more clouded state of sky, from a monsoon of nearly six months' duration, the immense extent of jungle, &c. It is favourable to the health of Europeans, and very unfavourable to that of the Indian native troops, as is the climate of Burmah generally. The hot months and rains are most unhealthy for the European, and the rains and cold weather for the native of India. The most unhealthy period extends from the month of August to December, attaining its culminating point in November, from its following the close of the monsoon in October. 4. Not aware of any district near the station the climate of which is more conducive to health. 5. No certain data can be given in comparing the salubrity of one station with another. What may have been an eminently unhealthy station 15 years ago is the contrary now, and vice versâ. That which may be healthy for the European may be unhealthy for the native. Cuddapah is, in my opinion, the most injurious to health of all the stations at which I have ever served.
III. SANITARY CONDITION OF THE STATION.	1, 3. There is no general map of the station and adjacent country in the executive engineer's office. The plan of the station is very incomplete; a tracing of it, however, is sent, which gives a sufficiently clear idea of the position of the river, nullahs, &c. All the drains in the cantonment are open, with a free outlet to the river. A ground plan is also sent, showing the general construction of the barracks.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	4. *Table of Barrack Accommodation:*— Date of construction, 1854, 1855, 1856. Total number of rooms or huts, 24 for Europeans, and 28 for natives. Total regulation number of non-commissioned officers and men; Europeans, 1,000; natives, 2,800.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in feet per Man of floor space.	Height of Men's beds above the Floor.	Doors and Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		′	′	Mean.	Feet.			′ ″		Feet.	Feet.
European Barracks -	40	120	20	16′	38,400	960	60	1 9	16	3½	3
Native Barracks - -	100	140	20	16	44,800	448	28	Sleep on floor.	16	3½	3
Do. Do. - -	50	70	20	16	22,400	448	28	Do.	14	3½	3
Guard Room - -	10	30	20	16	9,600	960	60	1 9	8	3½	3
Prison Cells, 2 - -	1	12	10	12	1,440	1,440	120	1 9	Ventilators all round top of wall, no windows.		

5. The windows are on opposite sides, and open outwards. There is a verandah all round the building, 10 feet broad, two ends of which are enclosed for serjeants' rooms. The verandah is never occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils.
6. Iron bedsteads, wooden cots, and mattresses, are used in barracks. The iron bedsteads are bad; wooden cots are preferred by the men.
7. The tents for European soldiers are 21 feet long by 15 broad, 5 feet high at the sides, and 10¼ in the centre, giving 315 feet superficial, and 2,441 feet cubic space. They are intended for 25 men, giving each man 12⅗ superficial, and 97½ cubic feet. They are made of thick white cotton cloth, doubled or trebled, and lined with blue cotton cloth. The European tent has a double fly, with a foot and a half between the flies.
8. The barracks are ventilated by means of doors and windows. The boarding of the wall is not carried up to the roof, but a space is left open for ventilation. The ventilation is quite sufficient to keep the air pure by night and day. No means are used for cooling the air of barrack rooms.
9, 10, 11. Barracks are constructed of teak wood; the roofs are thatched; the floors are planked, raised generally four feet from the ground. There is a free passage of air beneath. The materials used in construction are suitable. The barracks should be larger with double verandahs. The barracks and cantonment are kept in repair by the department of public works. Repairs are executed with tolerable rapidity. The officer commanding, senior surgeon, and executive engineer are responsible for the sanitary state of the cantonment. The walls and ceilings of barracks are cleansed and whitewashed whenever considered necessary by the medical officer; generally once a year.
12. The lavatories are temporary buildings. They are rooms 22 feet by 15, with partly planked, partly mat walls, Venetian doors and windows, and brick floor. The water is brought by Puckallies and Bheesties; there are 12 of them. Drainage is effected by means of open channels to the low ground adjacent, which is made use of generally as a garden.
13. The cook-houses are built of wood, with a centre wall of brick. The roofs are planked. Fire-places are constructed along the floor and next to the brick wall. Water is brought from the river or well by bheesties. The drainage of refuse water might be better. Linen is washed in the river by dhobies, and there is plenty of ground for drying it. The conveniences are sufficient for the wants of the station.
14. The privies are brick buildings; they are drained by drains leading to cesspools. The contents are received into iron buckets, one of which is placed under each seat, and all is removed daily to some distance outside the cantonment, and buried. The cesspools are for urine only. No solid matter can find its way into them.
15. Barracks are lighted at night by means of globe lamps, hung from the ceiling.
16. The drainage of the barracks is effected by open drains, which are mere excavations out of the ground. It is all carried into the river, about 100 yards from the barracks nearest to the river, and about 800 from the furthest. The drainage of privies is good, but the general drainage of the other buildings might be much improved. The buildings are, however, only of a temporary nature. No part of any of the barracks is damp. Whatever fluid refuse is not carried off by means of drains, partly evaporates, and partly sinks into the subsoil. There have been no complaints as to the sufficiency of the drainage. Cesspits are only attached to privies, and are distant from the men's quarters 150 to 200 yards. They have never been cleaned since constructed in 1857, nor do they require it. There are no foul ditches.
17. The cantonment is tolerably clear from all obnoxious matters; each regiment, detachment, and department keep their own lines clear. Refuse and manure from bazaars, &c., is carted away to the jungle.
18. The surface of the cantonment is kept tolerably free of vegetation, but requires constant attention. There are no old walls, &c., to interfere with the ventilation of the station, but the jungle should be cleared for 500 yards all round the cantonment.
19. With regard to the drainage of the bazaar, the water flows off readily to lower ground. The streets are at right angles, and sufficiently ventilated. The houses are rather crowded, caused from want of space. Water is procured from the river, and from one well recently made. Each house owner keeps the front of his house clean, and all filth is removed by sweepers. There is a large number of cows in the bazaar, and their removal would be advantageous; but there are many difficulties in carrying this into effect, from the absence of any ground to remove them to. There are no native houses nearer than the native town.
No nuisance is experienced from the wind blowing over native dwellings.
20. Animals are slaughtered for the use of soldiers a mile below the cantonment, on the river bank. The offal is carried away by the stream. No nuisance is experienced from the slaughter-sheds.

References to Subjects in Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	21. There are no bazaar horses. 22. There are no cavalry or artillery stables, or picketing grounds. 23. There are no quarters for married non-commissioned officers and men. No married people occupy barrack rooms with the men.
Officers' Quarters.	1. Compounds are too small, and the houses are too close together. There is little privacy, and a constant dread of fire. Nearly one-third of the cantonment has been recently burnt down. The drainage and ventilation are tolerably good, but there should be more space. No improvements are suggested, except what would involve a fresh laying out of the whole cantonments.
IV. Health of the Troops.	1. The station I consider favourable to health. The district is for the most part covered with jungle, and some parts of it therefore very malarious; but the native population are healthy and robust, and do not exhibit any of the signs of suffering from malarious disease. 2. I am not aware of their suffering from any epidemics except small-pox, or from any particular disease, or from spleen disease. 3. The general healthiness and robustness of the natives, I consider, result from the peculiarly moist but not relaxing climate, enjoyed during a great portion of the year: the wind from an extensive seaboard, which gives the province a semi-insular character. 4. The various regiments come from different stations of the Madras Presidency, and Her Majesty's 68th Light Infantry from Ireland. The native troops have suffered severely from the climate of Burmah, which produces in them fevers, rheumatism, diarrhœa, albuminuria, beriberi, atrophy, &c. No portion of the men's accommodation is more unhealthy than the rest. 5. The troops are not camped out. 6, 7. No experience of the health of troops at hill stations. 8. Hill stations, if well selected, would be decidedly beneficial to the health of the European troops. 9. Increased action of the bowels is generally experienced on proceeding from the plains to hill sanitaria, for which reason they do not seem so favourable for those suffering from chronic diarrhœa or dysentery. 10. With reference to the precautions necessary in hill stations, doubtless flannel and warm clothing generally, with abundant exercise and attention to diet, are of great importance in guarding the system against suffering from the decided change to a hill station, and enabling the valetudinarian to benefit thereby. 11. No experience of the seasons best adapted for residence in hill stations. 12. No injury is likely to be inflicted on the health of troops returning to service in the plains at well selected stations. 13. Not aware of any precautions for the protection of health on leaving hill stations for the plains, other than the general ones adopted on coming suddenly into a tropical from a temperate climate. 14. I am of opinion that the course most adapted to the health of European troops would be to locate them on moderately elevated hill stations, with short periods of service on the plains. Occasional change of station is conducive to the health of the troops. 15. No acquaintance of the barrack or hospital accommodation provided at hill stations or sanitaria. 16. I consider from 300 to 600 feet above the sea to be the range of elevation most suitable for hill stations in the tropics. 17. No higher ground near the station which could be advantageously occupied as a hill station. 18. Black cotton soil I consider especially unfavourable to health, while a gravelly soil with the laterite of Western India, and the red soil of the eastern coast, are perhaps the best in a sanitary view. 19. The soldier should not be sent to India before he is 20 years of age, and thoroughly trained. The troops should land in India in the end of November or beginning of December. No knowledge of the system at present adopted on troops first landing, as regards barrack accommodation, clothing, drills, &c. I think it of the first importance to guard the soldier fresh escaped from the monotony of a long voyage, from the excesses he is then so prone to indulge in. 20. I do not consider there is any particular advantage in sending the troops to an intermediate station, unless perhaps to allow young troops to attain mature vigour of constitution at a healthy station such as the Cape. 21. The communication from the port of debarkation to the interior is entirely by the river Irrawaddy, and troops are conveyed in transports with the greatest comfort and convenience. 22. I consider every soldier would derive benefit from revisiting Europe after a sojourn of 10 years in India. 23. With regard to the manner of conducting the business of medical boards in reference to invaliding, differences of opinion often arise, not between the medical officers themselves, but between them and the commanding officer, and the reason is obvious. A commanding officer brings before the committee a man who from long personal observation he knows to be unfit for service, although his health may be just sufficiently good to enable him to keep out of hospital. This fact weighs well with the committee, and the man having no fixed disease, and his name not appearing in the hospital books, medical officers cannot conscientiously, on medical grounds, invalid such a man. The commanding officer has an appeal to a board of field officers, and I think, under all circumstances, it is as good an arrangement as can be devised. 24. Invalids should leave India for home in February or March.
Diseases.	1. When disease is prevalent in an epidemic form, such as psora, it is usual to have parades for its detection. 2. No scorbutic disease among the troops at this station. 3. Hepatic disease seems unusually prevalent in this province. The largest number of admissions from any single class of disease is from hepatitis. 4. Dracunculus is a purely epidemic affection; the ova being deposited in the skin chiefly of the legs and feet, natives are the principal sufferers, from their habit of going bare legged, and wading in the tanks and streams. To avoid its occurrence the localities in which the parasite exists must be shunned.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	5. About $\frac{1}{7}$ of the admissions into hospital are from venereal disease. The best precautions for diminishing the liability of troops to this disease that suggest themselves, is the general discouragement of vice and debauchery among the men, especially drinking, the fruitful parent of every other vice. 6. The native troops suffer very severely from fever, chiefly of the intermittent quotidian type. Dysentery is of less frequent occurrence than at most Indian stations. Cholera occasionally occurs; last year 4 Europeans and 10 natives died from it. Small-pox prevailed epidemically at the beginning of this year (1860), when many of the Sepoys took the disease. Rheumatism prevails extensively and severely among the native troops especially. Fever.—The ratio of admissions is in the European troops from 250 to 300, and in the native troops 350 to 400 per 1,000 of total admissions. Dysentery.—In Europeans, 150 to 200 per 1,000, in natives about 65 per 1,000. Rheumatism.—In Europeans 36 to 45 per 1,000, in natives 60 to 100 per 1,000. Cholera and small-pox being only of occasional occurrence, formed but a very small fraction of the admissions. 7. The most frequently occurring zymotic disease is fever of the quotidian intermittent type. This disease is most prevalent during and immediately subsequent to the rainy season. During the rains the air is loaded with moisture, and during the months immediately following, with exhalations raised by the sun acting on the ground saturated by the previous rain, and by rank vegetation. The only conditions among the troops peculiarly predisposing to disease are the duties of night guards. Amongst the native population doubtless there is much want of cleanliness and general attention to sanitary points, but as the bazaars are at a distance, this does not affect the health of the troops, whose habits of cleanliness, or the reverse, are attended to by the regimental and brigade authorities. 8. As regards the influence of the soldiers' duties, occupations, and habits, is the occurrence of epidemic diseases, I have no particular remark to make beyond the well-known influence of exhaustion and depression of the vital powers in predisposing to the reception of epidemic disease. 9. No experience of the effect of quinine in small doses as a prophylactic against malarial diseases, but in strongly malarial spots I should certainly be disposed to employ it. 10. In order to prevent or mitigate epidemic disease at the station, the general sanitary condition should be improved by clearing away gradually the surrounding jungle, draining some swampy spots, and maintaining the cleanliness of the station, and freedom from undergrowth; also strenuous efforts should be made to disseminate vaccination.
V. Intemperance.	1. The soldiers at the station are on the whole temperate; about 4 per cent. are confirmed drunkards. 2. Of 562 admissions into the hospital, 4 were *directly* from drunkenness, or ·7 per cent.; and 25, or 4·44 per cent., indirectly from intemperance. Drunkenness is always punished as an offence.

Average Strength, 330.	Total Abstinents, Number, 5.	Temperance, Number, 306.	Drunkards, Number, 19.	Total, 330.	Per cent. from Abstinents.	Per cent. from Temperate.	Per cent. from Drunkards.
Admissions - -	5	531	26	562	93·5	173·52	136·8
Deaths - - -	—	7	—	7	—	2·287	—
Crime - - -	—	—	—	—	—	—	—

3. Colombo or Batavia arrack, 25 below proof, is issued monthly to the canteen at 2 rs. 4 a. per gallon, and retailed to the men at 2 rs. 8 a. The allowance for each man per diem is 2 drams or one dram of arrack, with 1 quart of malt liquor; spirit forms no part of a soldier's ration at the station. They are permitted, as above, to purchase 2 drams daily from the canteen at 1 anna per dram, and in the field or on the march the same quantity at the same rate from the commissariat. It is never given as a ration to convalescents; deleterious drinks are not openly sold in the bazaar or canteen that I am aware of, though they are frequently smuggled in and sold in every cantonment.
4. Spirits are in no case conducive to the health of the troops, but almost always injurious to it, and to the efficiency and internal discipline of the corps.
5. To abolish the sale of spirituous liquors in the canteen would be beneficial to the health of the troops if they could not procure worse liquor elsewhere, but if none was to be bought there they would probably get worse in the bazaars. But in this question is involved the loss which would accrue to the revenue from the abolition of the sale of spirits in the bazaars. In one cantonment 1½ lacs of rupees has been given for the Abkarry contract.
6. Wines and malt liquors are often beneficial to health, seldom injurious in moderation; spirits, on the contrary, are almost always injurious, and in no case conducive to health.
7. Coffee, tea, lemonade, soda water, and similar drinks are moderately used. With regard to health, efficiency, and discipline, these drinks are greatly superior to fermented liquors of any kind.
8. The suppression of the spirit ration would be beneficial if such a measure would stop spirit drinking, and beer or effervescent drinks were substituted for it.
10. I recommend a more close watch over the issue of spirits; that each man who drinks spirits should be specially registered, and that not even a dram should be issued without an entry being made of it, and to whom it is issued; this would involve less extra labour than is at first apparent. A monthly table noting from on one side the date, and from the other the names of the registered spirit drinkers, would be easily kept up. The advantages arising from such a system, both in regard to the assistance it offers to a soldier endeavouring to break himself of the habit, and the insight it would give into the real amount and extent of spirit drinking, and who drinks it, would more than amply compensate for the trouble involved. At present it is impossible to get accurate information as to who drinks much or little, or even who drinks at all.
11. The following are the more important of the canteen regulations:—
"3. No man of another regiment is to be admitted into the canteen without the written

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	sanction of his commanding officer, and of the officer commanding the artillery, and no spirits are to be issued under any circumstances to a man of another regiment. 4. The canteen will be open daily on week days from 10 to 12½ a.m., and from 1½ to 3 p.m., and from 6 to ¼ to 8 p.m., but no spirits will be issued at the first period. And on Sundays from 1 to 3 p.m., and from 5 to 6 p.m. 5. The utmost amount of issue to any one man in one day will be 2 drams of arrack, or 1 dram of arrack and 1 quart of porter, but no man is to receive more than 1 dram of arrack at the same period of issue. 6. No liquor is to be taken out of the canteen without the written sanction of the commanding officer; those men who wish to do so may receive not more than half the daily allowance at the dinner table by giving in their names to the orderly corporal, who will draw the amount. 7. No man on duty or under punishment is to enter the canteen, men on convalescent list are allowed to enter the canteen, but not to receive any liquor without the written sanction of the surgeon, countersigned by the commanding officer. 8. No games or singing are permitted in the canteen on Sunday, and all gambling at all times is strictly prohibited." In the bazaar no liquor is sold, and any one found bringing liquor into the cantonment without a pass is handed over to the civil authorities. The regulations are obeyed as far as I am aware.
VI. DIET.	1. The daily ration to European troops is as follows:— Bread, white - 1 lb. Rice - 4 oz. Tea - 5/7 oz. Coffee - 1½ oz. Salt - 1 oz. Beef - 1 lb. Sugar - 2½ oz. Vegetables, alternate days - 1 lb. Firewood „ - 3 lb. The ordinary tea ration consists of one-third green, and two-thirds black. The vegetable ration consists of such descriptions as may be procurable according to seasons. At this station esculents, such as yams, cocoa, and occasionally potatoes are issued when practicable, as they are more nutritious and preferred by the men to the green vegetables. The rations are issued daily under the superintendence of a warrant or non-commissioned officer of the commissariat department. Before issue they are inspected by a quarter-master and regimental officer of the day, also by orderly corporals of companies, who report to the day officer on the quality of the rations; if any article is considered objectionable a committee is assembled. 2. A complete ration, including vegetables, is issued daily, fruit is not supplied by the State. The regulated stoppage per man per day is 3 annas and 4 pice. There are three meals, the first at 7½ a.m., tea or coffee, bread and meat; the second at noon, bread, meat, and vegetables; the third at 4 p.m., tea and bread; 1 lb. of vegetables is given daily. 3. A greater variety in meat and the mode of cooking it would be an improvement, also a larger proportion of farinaceous diet; at this station beef alone can be procured. I have not heard of any instance of the European soldier selling his rations, or of any arrangement for its prevention. They usually purchase extra articles to add to it. 4. The cook-houses have cooking places built of brick and mortar down the centre; cooking pots furnished by the commissariat department are used to prepare the food; it is cooked by native cook boys. The kitchens are wooden buildings with brick and mud floors, and are kept as clean as practicable. There is a sufficient supply of water. The food is boiled, grilled, or stewed. The cooking, &c., is tolerably well done. Tea, coffee, or other refreshment before a march is a matter of regimental arrangement in many corps. 5. Small plots of ground near the barracks are re-cultivated where vegetables are grown for the soldier's private use, and are as advantageous as any others capable of being established at this station.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress is composed of flannel waistcoat, cotton shirt, worsted socks, white trousers, white frocks, red serge frocks, blue serge trousers, khakee jackets, red cloth tunic, cloth trousers, blue cloth great coat, dress and undress forage caps with white linen covers, waist belt with pouch and bayonet, shoulder belt with pouch in rear and cap pocket attached to it in front. The present new dresses are well adapted to this climate and for soldier's duties by day and night and at different seasons. I suggest that collars should be re-abolished, as the neck should be perfectly free in this climate. A waterproof cape would be a good thing for the soldiers during the heavy monsoon. The men should guard during the day in white clothing, and change to cloth at sunset, but this varies with the season. The men are protected from the sun by verandahs or trees when on sentry, and put on great coats in wet weather.
Duties.	1. It would be advisable in every respect that the men should be thoroughly drilled at home before being sent to India. 2. The soldiers rise at 5 a.m., and go to bed at 9 p.m.; parades generally take place four times a week from 5½ to 6½ a.m.; men do not suffer in health from drill. The best hours for drills, &c., in the hot season are before the rise and after the decline of the sun; but in the cold, when heavy fogs are frequent, not until an hour after sunrise. The average number of nights the men have in bed during the week is 6. 3. All guards are adjoining the barracks, except two about three-quarters of a mile distant; these are night-guards; they are mounted at sunset, and withdrawn at sunrise. The day-guards last 24 hours. There are roll calls at 4 p.m. and 9 p.m., and oftener as circumstances may require. The men are healthy, and night guards do not *seem* to affect them, but generally speaking the effect of night guard is a diminution of the power to resist morbid diseases in exact proportion to their frequency, and to their influence may be attributed a certain proportion of sickness. In this station I should say this is a predisposing cause of fever.

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation.	1. The following are the means of recreation and instruction:—There are no ball courts. There is one skittle-ground for each company. There is a school with assistant schoolmaster. A station library will shortly be established. It will not be lighted at night; but there is a coffee-room which is lighted, and may be called a day or club-room. About 1½ acres are under cultivation for soldiers' gardens, under the supervision of the commanding officers. There are no workshops other than a shoemaker's shop. One barrack is turned into a theatre. There is no gymnasium, but one has been sanctioned. I consider these amusements, together with cricket and boating—Government having liberally supplied four 10-oared boats—ample. Hard labour and exposure is not, I consider, detrimental to the European soldier in Burmah. For example—seven men have been employed for months in making bricks under the executive engineer, and though the work is hard the men have enjoyed excellent health. The same may be said of those who play at cricket, as scarcely a man has been in hospital, though much exposed to the sun. There is no restriction as to exposure to sun and rain off duty, nor has any case of disease been traced to the influence of voluntary exposure. I am strongly of opinion that no restriction should be placed on men in this respect, and that every indulgence should be afforded them. 2. There are sufficient means of recreation at this station, but what I would recommend is a system of workshops organized for different trades found amongst soldiers, which would give them profitable employment, and in no wise detract from their efficiency as soldiers. 3. Soldiers' savings' banks exist, and are much used. 4. There is sufficient shade from trees, &c. to enable the men to take exercise without injury to health during the day. Men play at skittles, quoits, cricket, &c., all day in the open air. To this I attribute their general good health. This station is eminently adapted for the enjoyment of life by the soldiers. Between the barracks and the river bank it is only a short distance, and this is green turf with trees here and there. Their boats also add much to their amusement. What with climate and local causes, I have never been at a station offering so many advantages from natural causes to the soldier as Thayet Myo.
IX. Military Prisons.	1. There are no military prisons at this station.
X. Field Service.	1, 2. There are no local regulations for medical field service. 3, 4. No reliable information as to the practical operation of regulations for the preservation of the health of troops in camp, or as to the arrangements adopted for field hospitals, &c.
XII. Hospitals.	1. Ground plan and sketch of the hospital of detachment H.M.'s 68th L.I. sent. 2. The hospital buildings are at one end of the line of barracks, and of the same general construction as them. They are remote from the bazaar and the civil population. They are open and freely ventilated. The sites are healthy and generally free from malarious influences. 3. The water supply is abundant and wholesome. 4. All impurities are removed to a distance from the hospital by sweepers employed for the purpose. 5. The hospital floors are raised generally about three feet above the surface, and there is a free perflation of air beneath, as they are supported by posts merely. The rain flows off the surface readily. The ground slopes from the hospitals, and there are small drains cut to catch the roof water and facilitate its removal. The hospitals are built, some of planks and some of mat walls, with a thin thatch, and are therefore altogether insufficient to prevent the heating power of the sun upon the buildings. The wards have verandahs on all sides, affording sufficient shelter from the sun's rays. During the sickly season the verandahs on one side of the native hospitals are used for the sick, from the great increase of sickness then: they all consist of one floor only. The following Table shows the accommodation:— Date of construction, 1854–5. Total number of wards—2 men's, 1 women's, and 1 smaller extra ward. Total regulation number of beds, 24 in each ward; 48 for men.

Wards.	Regulation Number of Beds per Wards.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet for Bed.	Height of Bed above Floor.	Windows.		
		Length.	Breadth.	Width.	Cubic Contents.				Number.	Height.	Width.
								Feet.		Ft. In.	Feet.
1	24	118·4	20	18·10	33,720	1,405	98 sq. ft.	2	12	3 5	3
2	24	118·4	20	18·10	33,720	1,405	98 „	2	12	3 5	3

Most of the hospitals, except one occupied by native troops, are sufficiently well placed for ventilation. The European hospitals have Venetian windows; those of the native hospitals are of mats, and are opened sufficiently in the day for ventilation.

6. In addition to the doors and windows there is an open space between the roof and the top of the wall, admitting free ventilation in all the hospitals and barracks. The Venetian windows open to the sides like a lattice or French window.
7. No means of cooling the air by tatties or thermantidotes are employed at this station.
8. There are no means of warming the hospitals. The ceilings and walls are whitewashed about every six months, or upon requisition by the medical officer.
9. The privies are small detached buildings, with night chairs and vessels for holding urine. The filth and urine is removed frequently during the day, and the privies are kept clean by the sweepers employed for that purpose.
10. The lavatory arrangements are sufficient.
11. Various kinds of baths are provided for the sick.
12. Washermen are employed to wash the hospital linen at a regular monthly rate of pay.
13. The storage is sufficient for all purposes.
14. The bedsteads in use in the European hospitals are wooden with rattan work.
15. Cook-rooms are attached to all the hospitals, and cooks also for the European hospitals. The cooking is properly done, and can be sufficiently varied.

THYET MYO. MADRAS.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	16. Diet, &c. according to regulations. 17. A proper staff of ward coolies, leechmen, nurses for female ward, &c., is always kept up for European hospitals, in addition to hospital serjeants and orderly attendants, as required by severe cases. In native hospitals there are only two toties to apply leeches, and do the dirty work of removing filth, &c. 18, 19. The sanitary condition of the hospitals is sufficiently good, except that the hospital of European artillery is constructed of mats in frames instead of planks, and one of the hospitals of the native regiments is badly situated, while the other two native hospitals are too close together. 20. The sick and convalescents are, when requisite, carried out in doolies, or allowed to walk morning and evening. 21. Separate wards with nurses are provided for the soldiers' wives and children. The present arrangements seem ample and satisfactory. 22. There are no regulations enforced beyond the Madras Presidency hospital regulations. 23. The medical officer sends in requisitions for any repairs or sanitary measures needed, which being sanctioned by the brigadier commanding the station, are complied with. Sufficient hospital comforts are always available. 24. There are no convalescent wards. No advantage could accrue from them at this station.
XIII. BURIAL OF THE DEAD.	1. The burial ground is about 500 yards from any house; it is within the limits of the cantonment, and sheltered from all winds by a tope of trees. 2. It is 400 paces square. The soil is red earth and gravel. The water runs off. No knowledge whether decomposition takes place readily. The ground is carefully kept. 3. The grave space is 6½ feet by 3 feet, with an interval of 3 feet; the depth is 6 feet. Graves are never re-opened. The time of interment is in no case compulsory, but as a rule, if a man dies during the day he is buried on the following morning; and if in the morning, he is buried in the evening. The same rule applies to native troops. 4. The graveyard is never offensive. 5. The dead of camp followers and bazaar people are taken to the jungle and either burnt or buried. 6, 7. No injury accrues to public health from the present practice. No improvements are suggested.

(Signed) G. W. OSBORNE, Brigadier, Commanding Thyet Myo.
G. P. DE P. FALCONNET, Lieut.-Engineer, Executive Engineer, Thayet Division.
C. TIMINS, Surgeon, Senior Surgeon, Thyet Myo.
T. C. LONGCROFT, Captain, Major of Brigade.

15th June 1860.

MOULMEIN.

Accommodation :—Native Troops.—Infantry - - - One Regiment Native Infantry.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The cantonments of Moulmein are on two sides nearly surrounded by the broad waters of the Salween, close below its junction with the Gyne and the Attaran. On the south is a native town, prettily situated on the slopes of the hills which dip to the Salween westward, and the Attaran eastward. A ridge of hills, varying from 100 to 300 feet of altitude, and half a mile distant from the Salween, forms the eastern boundary of the station and principal part of the town, all of which, as also the cantonments, are on dry red soil. Swamp and rice fields prevail east of the hills. The station to the west and the town are prettily wooded. Jungle abounds on the hills where not occupied by the residences of the upper classes. An unhealthy dirty ditch, covered with jungle, surrounds the cantonments east and south. Water is everywhere and at all seasons abundant. Vegetation is very rank during the rains, which are very heavy. 2. The cantonment is about 50 feet above the sea. It rises from the river bank north and east to a maximum height at its south-east angle of 150 feet, which point would command the cantonments and the best part of the town. The same ridge of hills which forms the promontory, on which Moulmein is situated, continues it in a north-north-west course, broken only here by the united waters of the Salween, the Gyne, and the Attaran, and rises to the height of 3,000 feet to 4,000 feet, but only in sharp ridges, with but little dry soil at their base, till some distance from the station southwards they run in a similar course, but only obtaining a few hundred feet of elevation, and serve to divide the waters of the northerly running Gyne from those of the southerly going Salween,—a very beautiful range of hills, broken only here and there by easy passes. No place could be healthier than the present station. The low hills would be more airy and agreeable in the hot weather, but water and steep roads are objectionable in a military point of view. As the hills command the town and cantonments, they would require to be occupied in all cases of disturbance, and are now perfectly accessible for artillery. 3. At a distance of two days river sail by boat, and one long march, there is said to be very beautiful table land, varying at from 3,000 to 8,000 feet of elevation. The country is wild, and but little known and peopled, only by sparsely scattered nomadic Karen tribes. Other table lands, more extensive, but only having about 2,000 feet of elevation, exist some four marches southward. 4. The station is surrounded by lakes, marsh, nullahs, &c., and almost all the waters in them are washed by every tide, which at Moulmein has a rise of 20 feet. The rice fields or marshes are only freed from inundation in the dry weather, but the vicinity of the station

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	is not at any season liable to overflow. There are no ravines, water pits, nor any broken ground near the station. 5. The station is now very much covered with jungle and ruinous houses, but these have been ordered to be cleared away. I imagine that the temperature of the station is not raised by the buildings being exposed to reflected sunheat. The cantonments are exposed both to the sea-breeze and the north-easterly wind during the cold season. 6. A great quantity of dense jungle runs along the east face of the low range of hills which bounds the cantonments to the east. There are no works of irrigation near the station. The cultivation of rice is not that I am aware of prohibited, except within the limits of the cantonment; neither is the cultivation of indigo, nor the preparation of hemp or flax, carried on near the station. 7. The town of Moulmein abuts on the boundary pillars of the cantonments. 8. The stones and soils of the district are mostly those of the tertiary group, with deep alluvial basins and plains, broken by long regular lines of sandstone, running about 30° west of north, and dipping eastward. A deep blue clay is generally found about 20 feet below the surface, and yields an abundant supply of fresh water even to the seashore. The character of the dry lands is more or less ferruginous. All stations and towns have been occupied for one or two centuries. 9. Water is usually found at a depth of 20 feet in the dry, and 10 feet in the rainy, season below the surface. 10. The rainfall and water from surface springs flow very readily away; generally speaking, it sinks into a pervious subsoil, and oozes out in the rivers, but does not lie on the surface till it evaporates. There is no drainage from higher ground which passes into the subsoil of the station, as the lie and dip of strata is so very considerable that what sinks into it will be carried deep and in an opposite direction to the station. 11. The water supply of the station is derived from wells. It is not stored in tanks, and I cannot say what plants or animals it contains. 12. Four wells of a moderate hard water of excellent quality supply the station. The water is raised in buckets. 13. There are no other topographical points bearing on the health of the station which are not included in these queries. 14. New stations, whether on hills or plains, are generally selected by a committee of commanding officers and medical men specially selected by Government for their known fitness for such a duty, together with the engineer officer to be entrusted with the building of the station. The service could not be better conducted.
II. Climate.	1. There are no means or instruments, that I am aware of, available at this station for conducting and registering meteorological observations. 2. No table of meteorological observation appears to have been kept here, and the only information I can afford for the year 1860 under this head, is the amount of rain which fell. This is as follows in inches, viz.:—January, 0·10; February and March, none; April, 1·90; May, 6·10; June, 31·90; July, 36·30; August, 32·0; September, 19·00; October, 5·10; November, 0·40; and December, none; thus making 133 inches in the course of the year. The average annual fall of rain is believed to be from 150 to 200 inches. 3. In my opinion the peculiarity of the climate of Moulmein is its excessive moisture, owing to the north-west monsoon lasting from the end of April to that of September, during which time the rains are excessive. The absolute heat is not so great as that of India generally, but from the combination of moisture and heat the temperature of Moulmein during the hot season and the rains is most exhausting to some constitutions. There are fogs, I believe, in the cold season, but I, as yet, have never seen any in the hot weather or during the rains. The damp is greater than I have experienced in Turkey or India. I am not aware of any tree planting in this station, nor do I think it would be needed. Burmah being over wooded, I am unable to say anything about irrigation. I have not seen any dust nor dust storms up to this date, and my residence here only embracing the period of six months, I can consequently say but little on this head. I do not believe that the climate of Moulmein agrees with natives of India, particularly those who come from the southern part, such as the Telinga and Malabar races. The present diet, shelter, and clothing of the native troops are, I think, sufficient. Drill only takes place in the cold season, when the ground becomes firm and dry. The most unhealthy months are those at the commencement and termination of the monsoon, viz. May and September, the prevailing diseases then being, dysentery, diarrhœa, intermittent and remittent fevers, rheumatism, and psoriasis. 4. I understand that at the entrance of the Moulmein river there is a place called Amherst, the climate of which is said to be more conducive to health than that of this station. 5. During my period of service in India (now three years and five months), I have been stationed in Cawnpore, Futtypore, Calpee, Banda, and Secunderabad, and I consider that any prolonged residence in Cawnpore, Calpee, or Banda, must be attended by results positively injurious to the health, particularly of Europeans.
III. Sanitary Condition of Station.	1, 2. There is now only one irregular regiment of native infantry in the station. The soil of the station is not sufficiently strong to answer the purpose of drainage without masonry. The outlets of the drains, sewers, &c., are quite free. There are no cesspools, but a very objectionable fort ditch, which it would cost about 40,000*l.* to fill up. 3, 4. The native infantry barracks are of wood, raised 3 feet above the ground, with doors and windows at every 10 feet. The ventilation is ample. These are the only barracks in use. 5. The windows are on opposite sides of the barracks, and open on hinges. There is a verandah all round 8 feet broad, but this is never occupied as sleeping quarters by the soldiers or any other persons. There are no jalousies or jhilmils. 6. Flanked cots are in use in the barracks for sleeping purposes, but the native soldiers generally prefer the floor. 7. Tents are not used in the station. 8. Every chink of the planks, roof, and floor besides the doors and windows at every 6 feet afford sufficient means of ventilations, and keep the air pure by night as well as by day. There are no means required in this province for cooling the air for barrack-rooms. 9. The barracks are constructed of wood, tents of cloth, and huts of bamboo and grass. 10. The floors, which are of wood, are raised 3 feet above the level of the ground, so that there is a perfectly free passage of air beneath them.

MOULMEIN. MADRAS.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	11. The materials and construction of the barracks, huts, &c., are very suitable for the climate, and no improvement in either of these points would increase their salubrity. The walls and ceilings of the barracks are cleansed and limewashed annually. 12. There are no lavatories, baths, or washing places for the men at this station. 13. A cook-room is attached to every three or four barracks, where the native soldiers cook for themselves on raised fireplaces. 14. A marginal sketch of the privies, &c. sent herewith. 15. The barracks are lighted at night by lanterns suspended from the roof. 16. A deep drain runs round each building, leading into a freely running stream or the main river, and this is found sufficient for conveying away all surface water and drainage. I have no fault to find either with the barracks or hospital on the score of dampness, inasmuch as no place can avoid being saturated with moisture during the monsoon, and so long as the roof remains watertight no more can be expected. There are no cesspits near the station or wells, but the old native fort ditch before mentioned surrounds the cantonments on two sides. 17. The surface cleansing of the cantonments and their vicinity is conducted by officers commanding the corps, with occasional aid from the executive engineer. All the refuse, &c. is removed in hand carts. 18. In consequence of the desertion of the cantonment, the ruinous state of the houses, and the rapid growth of vegetation, the surface has not been kept free, and there are numbers of high and thick hedges, but these have been ordered to be cut and removed. 19. The bazaar is kept very clean, and no improvement on this head is practicable. The native houses are generally clean, and the privies being erected over tidal nullahs, are very seldom offensive. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. No animals are permitted to be slaughtered within the limits of the cantonments. 21, 22. There are no stables or picketing grounds for artillery, cavalry, or bazaar horses at Moulmein. 23. There are no Europeans at this station.
Officers' Quarters.	1. The sanitary condition of the officers' quarters at this station is good. The necessary orders with reference to the removal of houses in a ruinous state, and to the clearing of compounds have been already issued.
IV. HEALTH OF THE TROOPS.	1, 2, 3. I do not consider the station to be an unhealthy one, but I am unable to say anything about the native population as they have never come under my observation nor treatment. 4. The regiment was at Kamptee for two years and eight months, and left on the 10th of October 1859. The corps seems by the returns to have enjoyed good health whilst there; the principal diseases being fevers of the intermittent and remittent types. The regiment arrived in Moulmein on the 21st January 1860, and since then sickness has been very prevalent amongst the men, the prevailing diseases being diarrhœa, dysentery, febrile affections, rheumatism, psoriasis and ulcers. I do not find any portion of the men's present accommodation more unhealthy than the rest. 5. The troops at this station have not been camped out since March 1861, when I took medical charge of them. 6, 7, 8. I have never been in charge of troops in the hills; but from the little I know of hill stations, I think that they are well suited for Europeans. 9, 10. No replies to these queries. 11. As far as I am enabled to judge, I do not think that a residence in the hills of less duration than 18 months or two years would suffice to enable troops to derive the full benefit of such residence to their health. 12. I cannot state confidently, but I think that a very prolonged residence in a hill station might unfit troops proceeding on duty in the plains, in the same way as a long residence in a temperate climate might unfit them for their stay in a tropical one. 13. I think troops should not be removed from the hills to the plains either in the hot season or during the monsoon. 14. As a general rule, I think, that a moderate residence in the hills, with short tours of duty in the plains, the most conducive to the preservation of the health of troops serving in India. The present rule is to let a corps remain three years in a station. I believe it to work well. 15, 16. No experience. 17. I am not aware of any higher ground near this station, which could be advantageously occupied as a hill station. 18. The most unhealthy station which I have as yet known is Banda, in Bundelcund. It is situated in a plain of clay and gravel, interspersed with large hills consisting of water worn granite boulders. 19. I consider 22 or 23 years the best age for soldiers to proceed to India, and the cold season the best period for landing them here. I never did any duty with troops newly landed, having been sent immediately on my arrival in Calcutta in April 1858, on active service in the North-west Provinces; but with freshly arrived troops, I would advise, as a precaution for the preservation of their health, an avoidance of undue exposure to the mid-day sun, employment within doors, and precautionary measures against their visiting bazaars and arrack shops. 20. If soldiers land in India in the cold season, they may get accustomed to the climate even in the plains, but if the hot weather sets in, the newly landed might with benefit be sent to the hills till the next cold season. 21. I have generally known troops on landing to march from the port to the interior, and I think that the present regulations for marching ample in precautions. 22. I deem ten years sufficient for a British soldier to serve in India. 23. I have acted as a member on several invaliding boards, and I think they work well. 24. It would be advisable to send invalids home in February, so that they might arrive in England about the middle of June, or earlier if possible.
Diseases.	1. There are inspection parades for scabies and venereal disease, generally once a week amongst the recruits. 2. I have never seen any scorbutus or scorbutic disease among the troops at this station, but if the disease should show itself, I would advise the exhibition of lime juice.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	3. I have only had three cases of hepatic affection in the course of six months, 2 of which were the result of intemperance. The disease is very often caused by exposure to a cold wind when heated by exercise. Any person subject to hepatic disturbances should, in my opinion, avoid cold bathing, stimulants, and exposure to the noon-day sun. Chronic dysentery if unchecked causes abscesses on the liver. 4. I have never seen dracunculus in Burmah, but it is very prevalent in Secunderabad. Whilst I had charge of the 49th regiment Native infantry, as far as I can now remember, the proportion was as high as nine or ten per cent. of total sick, and the cause attributed the water. This I am certain of that the 10th regiment Native infantry stationed in the same place, and of which also I had the medical charge had few, if any, cases of dracunculus amongst them. 5. The proportion which venereal diseases bear to the total sick in hospital from all other diseases is 1 in 9. I am clearly of opinion that the only precautions of any value against this disease are to establish lock hospitals and to institute a strict watch, and health inspections at stated periods over the bazaars and their inhabitants. 6. Since I assumed medical charge of the 32nd regiment of Native Infantry, I have found the most prevalent form of diseases to be, and in proportion, as follows, viz. :— *Fevers.*—Intermittent and remittent - - - 1 in 17 admissions. Dysentery - - - - - - 1 „ 17 „ Cholera - - - - - - - 2 „ 17 „ Rheumatism - - - - - - 3 „ 17 „ 7. The most marked nosological character of these diseases, in their asthenic nature, requiring the exhibition, in many cases, of wine and stimulants. They are most prevalent in the commencement and termination of the monsoons. Great heat, combined with an atmosphere overcharged with moisture, precede or accompany their appearance. I have never treated any of the inhabitants of the bazaars, my experience being solely confined to the sepoys, who in this station live in wooden barracks, and not in lines, as is the custom in India; but from what I have seen, I consider the native portion of Moulmein as filthy to a degree. The exposure consequent on their duties, together with the non-nutritious nature of their food, which consists chiefly of rice and dhol, predisposes the sepoys to these diseases. 8. I think that the custom of the sepoys of sleeping on the ground, either in barracks or camps, in a great measure induces epidemic disease. 9. I have never seen small doses of quinine given, either to natives or Europeans, as a prophylactic against malarial diseases. 10. In order to the prevention or mitigation of epidemic disease at this station, I would recommend that cleanliness be enforced in the native parts of the town, a strict supervision of the condition of the barracks, protection, as far as is possible, from the noonday sun, a modification of the uniform to suit it better to the climate, and avoidance of very long parades, particularly in the hot weather.
V. Intemperance.	1. The soldiers at this station are generally temperate, and there are no confirmed drunkards. 2. I have had only two admissions into hospital in six months, resulting indirectly from intemperance. I am unable to give any statistics of the proportion of admissions caused directly or indirectly from intemperance, to the total admissions; but the regiment is a native one, and intemperance is the exception and not the rule. I think that the moderate use of fermented liquors is rather useful than otherwise to Europeans; but at the same time I consider the habit of giving men a dram in the early morning, on the march a bad one: give them rather a cup of coffee and a biscuit. In my own case, I have found it the best plan. Drunkenness is always punished as an offence. 3. No canteen: spirits are sold in the bazaar. Spirit forms no portion of the ration of a native soldier, but the quantity consumed by each man, and its quality, are unknown. The non-commissioned European officers attached to a native regiment are allowed 60 drams per mensem, which is generally drawn by them on indent from the commissariat stores. To the best of my belief, no drinks other than intoxicating drinks are sold in the canteen or bazaar which are injurious to health. 4. As far as natives are concerned, the use of spirits is so trifling that I have never found health injured, or the efficiency and internal discipline of the corps impaired by it. 5. Spirit forms no part of the ration of a native soldier; but, so long as there are licensed shops in the bazaar for the sale of spirits, it is impossible, I think, to restrict the use of it. 6, 7, 8. These queries are only applicable to European soldiers. 9. It would certainly be better to permit only the sale of coffee, tea, &c., in the canteens and bazaars as spirituous liquors are, if taken in any quantity, deadly in an Indian climate. 10. I would advise the prohibition of the sale of spirituous liquors in the canteens; but then the arrack shops should be well looked after, as the men will go there, and, if they must drink spirits, better for them to drink it at a canteen where it is unadulterated, than to poison themselves with bazaar arrack, which often consists of bad spirit, rancid cocoa-nut oil, and sometimes drugged with bhang and chillies. 11. There is no regimental bazaar maintained at this station.
VI. Diet.	All the questions under this head refer to European soldiers; but the native soldiers at this station have excellent cook-rooms, clean and well ventilated; the different castes have a defined portion of the cook-room allotted to them, and bheesties furnish an ample supply of water from the neighbouring wells.
VII. Dress, Accoutrements, and Duties.	1. The dress and accoutrements of the 32nd regiment are according to the regulations on the subject for a native regiment in the Madras army. The men are allowed to convert old coats into jackets, which, with the boat cloak, is used as a guard dress, with cloth or linen trousers, according to the season. The guard accommodation at this station is generally good, and the dress well adapted to the climate.
Duties.	1. Not applicable to native soldiers. 2. From the 15th of May to the 15th of October little or no drill can be carried on at this station on account of the rain. For the other portion of the year there is drill or roll call every morning, and evening drill during November and December (setting up drill). The drills commence as soon after daylight as possible, and from five to six o'clock in the evening, which I consider the best time; they last little more than an hour at a time. The troops enjoy better health during the drill season. They have one holiday in the week,

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References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties —*Duties.—cont.*	besides Sunday (General Regulations, page 152, para. 6), and five nights in bed during the week. 3. The furthest guard is about one mile from the barracks. Day and night guards last 24 hours, night guards from sunset to sunrise; sentries are relieved every two hours. There is a roll-call by day. At 10 o'clock every night it is ascertained that the men are all present in barracks (absentees are punished), and at a later hour the officer of the day frequently visits the barracks to see whether the men are all then present or not. Night guards at this station I do not consider particularly prejudicial to health. The men are allowed to shelter themselves from rain, and are taught to move about briskly at other times.
VIII. INSTRUCTION AND RECREATION.	The questions under this head are applicable only to European soldiers.
IX. MILITARY PRISONS.	1. The solitary cells at this station are properly constructed, and well adapted for the purpose required.
X. FIELD SERVICE.	1. I am not aware that any local regulations for field medical service exist. 2. I conceive that the opinion of the medical officer, as regards the conduct of the line of march of troops, camping, bivouacking, &c., would seldom or never be at variance with that of the commanding officer, and I am of opinion that in these respects the voice of the medical officer should be attended to as far as possible. 3. Encamping grounds are generally marked by fixed boundaries, but where this is not the case the highest and best ground, with a due regard to the supply of water, is selected by the commanding officer, the medical officer having the power to object to such ground should he see fit. The commanding officer would, I conceive, if possible, attend to the opinion of the medical officer. Horses, cattle, &c., are invariably kept in the rear or on one side of the line of tents of both officers and men. 4. I am unable to answer this question fully, but conceive that one rule, as regards field hospitals, ambulances, and transport of the sick, &c., is applicable to all the regiments in the Madras army.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information.
XII. HOSPITALS.	1, 2. Plan of hospital forwarded. It is placed at about 30 yards in the rear of the barracks, and about half a mile from the bazaar and houses of the civil population generally. The site is open and healthy, and the ventilation free. There are some trees, but they do not interfere with the free passage of air. 3. The water supply, which is derived from a well close by the hospital, is abundant and good. 4. The ground about the hospital is drained by open trenches, which run all round the building, and empty themselves into the ditches on the roadside. The outlet into those ditches is about 18 feet from the hospital. 5. The height of the hospital wards from the ground is four feet two inches, the air having a free passage beneath, as the building is raised on wooden supports. The roof water falls into the before-mentioned drains, by which also the surface drainage is effected. These means are sufficient. The hospital is built of wood; the roof and walls are single, but quite thick enough to keep the wards cool; and the ventilation is ample. There is a verandah on either side of the hospital, nine feet in breadth, and sufficient for shelter, but it is never used for the accommodation of sick, except the wards are full. The hospital consists of one flat.

Table of Accommodation.

Total number of wards - - - - 3.
Total regulation number of beds - - - 30.

Wards, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.	Feet.	Inches.	Inches.		Feet.	Feet.
3	10	39½	20	18¾	14,718¾	1471⅞	87 by 31½	18½	6	3	3

The hospital is so placed as to receive the full benefit of the prevailing winds. The windows of the hospital open in the centre, and the ventilation is thorough.

6. The wards are ventilated by the windows and doors, and there is always a free passage of air through them. The jhilmils are the same that are always seen in India.
7, 8. Thermantidotes and tatties are not used in Burmah. There are no means either for cooling or heating the air of the hospital, nor are any such required. The walls and ceilings of the hospital wards are cleansed and limewashed every three months.
9. The privies are distant about 15 yards in the rear of the hospital, and are cleaned out daily. I never heard of cesspits to privies either in India or Burmah. The task of cleaning privies is deputed in Bengal to Mehters, and in Madras to Toties.
10, 11. The native sick always (if able) wash themselves, but when a man is not, one of his own caste does it for him. There is a well in front of the hospital, and plenty of chatties filled with water at the men's disposal.
12. The hospital linen is washed by the commissariat department.
13. The storage is sufficient and dry.
14. The cots are of wood, with bottoms of wood. The sepoy always brings his own bedding (a sutringi) with him into hospital.
15. There is a small kitchen in the rear of the hospital, but it is only used for cooking such extras as are ordered for the sick, such as chickens, mutton, &c. Properly speaking, native sick are not dieted in hospital, but provide their own food, which is cooked in the regimental cookhouses by men of their own caste. The hospital kitchen is a square wooden building, with brick fireplaces raised in the centre, and is ample for what is required.
16. Principal forms of diet tables used in a native hospital are forwarded.
17. Every patient who requires it is provided with an orderly of his own caste. An hospital havildar is appointed monthly.

References to Subjects and Queries.	Replies.
XII. *Hospitals—cont.*	18. I am of opinion that the sanitary condition of the present hospital of the 32nd regiment native infantry is good. There have been no cases of hospital gangrene or pyæmia. 19. I have no complaints to make of sanitary defects or deficiencies. 20. There is plenty of ground about the barracks and hospital, in which convalescents may take exercise. The roads are sheltered by trees, but there are no benches. 21. Native troops do not bring their families to Burmah with them. I consider the present hospital arrangements satisfactory. 22. I am not aware of any special local hospital regulations. Every medical officer is guided by what is laid down in the Madras medical code. 23. With respect to the sanitary state of this hospital, repairs to buildings, change of diet, medical comforts, &c., the medical officers have ample powers. They furnish indents for what is required, which indents, on being countersigned by the Deputy Inspector-General of the division, are then passed and acted on. 24. There are no wards or hospitals for convalescents at this station. When a sepoy is put on the convalescent list, he lives in the barracks, and presents himself daily at the hospital for inspection.
XIII. Burial of the Dead.	1, 2. The burial ground for British troops is at the north-east angle of cantonments on the seaside. Its area is about three acres, and is very carefully kept. The drainage is good, and decomposition rapid. 3. There are no regulations as to distance between graves; the directions received at this station from Bengal on the subject of graveyards being to the effect that this and all matters connected with burials shall be left to the discretion of the chaplain. Graves are generally dug about five or six feet deep; they are never re-opened, and one body only is buried in a single grave. There are no rules for interment after death. Epidemics have never prevailed in this station. 4. The graveyard is never offensive. Bodies are generally buried the day after death. 5, 6, 7. The bodies of deceased camp followers and bazaar people are removed by their friends. No injury accrues to the public from the present practices, nor are any improvements to be suggested.

(Signed) H. W. Blake, Lieut.-Colonel,
Commanding Moulmein.
Robert Gordon, Major,
Commanding 32nd Regiment Native Infantry.
J. N. Forlon, Captain,
Executive Engineer T. Provinces.
James T. J. Doyle,
Assistant Surgeon 32nd Regiment Native Infantry.

2nd November 1861.

CUTTACK:—BENGAL CIVIL STATION.

Accommodation—Native Troops. { Artillery - - 1 company.
Infantry - - 1 full regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. The station is situated on a narrow tongue between the Mahanuddy river and its arm, the Katjooree; its immediate vicinity is flat, but a range of low hills extends north and south, approaching within five miles westward of the station. Beyond these are hills of greater height, covered entirely with jungle. The soil of the station is light alluvium, the rivers which bound it presenting in the dry season vast surfaces of sand. Between the elevated banks of these rivers and the hills is low ground, which here and there is diversified with swamp. The hills above mentioned are thickly overgrown with low jungle, but contain no large timber. The volume of water, whether in the rivers, tanks, or elsewhere, is excessive during flood season, but, though ample for practical purposes, during the remainder of the year does not cover any very large extent. 2. The elevation of the station above the sea varies between 75 and 80 feet, but is, generally speaking, on the same level as the adjacent country. It is 25 to 30 feet above the low water level of the rivers bounding it, but is very little above their high flood level; indeed, parts are below that level, and but for protective works would be inundated during extraordinary floods. About 8 miles from the station, in a north-east direction, is a plateau of laterite ground, 30 or 40 feet higher than the station, but which, owing to the heat given off by the rocky soil, and the difficulty of procuring water, could not be pronounced a more healthy situation for a cantonment. 3. A range of mountains, of which several summits reach the height of 2,000 feet above the station, extends within 20 miles of it. The sides of these mountains are steep and rocky, and they contain little or no table land. Megaseni, in the Nilgurh range, situated about 120 miles N.N.W. from Cuttack, is topped by a table land 3,800 feet above the level of the sea. 4. As stated before, the station is bounded by two arms of a river. It is situated about 50 miles from the coast of the Bay of Bengal. The station itself, and its immediate vicinity, is protected from inundation by embankments and revetments. The neighbouring plains are, however, peculiarly liable to inundation from July to October, and are in ordinary seasons overflowed for short periods during those months. Down the centre of the tongue of land, on part of which the cantonment is situated, lies a flat drainage line, which is a mere swamp during the rainy season, and has been known to produce fever. 5. The station is, generally speaking, fully exposed to the winds, and though interspersed with trees, hedges, gardens, &c., is not so encumbered as to impede ventilation. The buildings are, for the most part, surrounded by trees, but where they are open the reflected heat may,

CUTTACK. MADRAS.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	to some extent, increase the general temperature of the station. The station is exposed to a land wind during the north-west, and to a sea breeze during the south-west Monsoon. The latter, by modifying the temperature during the hot season, has a salutary effect on the health of the station. The former has been thought to produce the sickness which occasionally occurs during the rains. 6. The neighbourhood is for the most part under cultivation. There are no works of irrigation which in any way affect the health of the station; indeed the district is remarkably devoid of useful works of this character. The cultivation of rice is not prohibited, and in many localities comes up to the very boundary line of the cantonment; but there is no cultivation of indigo or flax. 7. Cuttack, a large town of about 35,000 to 40,000 inhabitants, is situated in the immediate vicinity of the cantonment, occupying one bank of the tongue of land already referred to, the other bank of which is occupied by the cantonment. The extreme width of this tongue is two miles. 8. The district consists of an alluvial delta resting on hills of gneiss, the bases of which are surrounded by platforms of laterite. Cuttack having been the capital of the province of Orissa under former governments, and a very important city, it is probable that the ground covered by the present station was formerly occupied. Indeed the most conspicuous object within the cantonments is the Old Mahratta Fort. 9. Water is usually found at a depth of from 25 to 30 feet below the surface, the rise and fall being chiefly dependent on the rise and fall of surrounding rivers, during the dry and rainy seasons respectively. 10. The drainage water flows off pretty readily, but owing to the permeability of the soil, a considerable quantity must pass off through the subsoil. It does not ooze out near the station, as it finds its way into the adjacent rivers. A portion of it also drains into the numerous tanks which cover the surface where it undergoes evaporation. There is no higher ground adjacent the drainage from which passes into the subsoil of the station. 11. The water supply is derived from the river and wells, and is also stored in open tanks, the larger of which are for the most part full throughout the year. The tanks abound in confervæ, and the usual water plants; most of them contain fish, but there is no peculiarity worth noticing in their fauna or flora. The tanks are generally used without distinction for drinking, bathing, and other purposes, with the exception of those in the cantonment, in the immediate vicinity of the hospital, one of which is used for drinking and the other for bathing. Especial care is taken that these tanks suffer no pollution from leaves or other impurities falling into them; but such precautions are not used with reference to other tanks. A ditch surrounding the fort is believed to produce occasional malaria. The means of removing the nuisance is at present under contemplation. Various tanks not under the military authorities become offensive during the hot season. 12. The water supply is sufficient; that from the river and wells is limpid, and devoid of any offensive qualities. It is hard, owing to the admixture of saline matter, &c., but no analysis having been made, its chemical composition and microscopic character cannot be stated. There is at all seasons a sufficient supply of pure and good water, and no measures are required to increase the supply or improve the quality. 13. No reply to this query. 14. The formation of new cantonments in this district has not for many years occupied the attention of the authorities on any large scale. The station of Sumbulpore was occupied as an important military position without reference to its sanitary conditions, and the amount of sickness has, as might have been expected, been considerable.
II. CLIMATE.	1. A thermometer and rain gauge are supplied by Government for conducting meteorological obvervations; but the only barometer in the station is the private property of the civil surgeon. 2. No reliable record exists in the office of the civil surgeon for any lengthened period from which any trustworthy data could be drawn to prepare a meteorological table. 3. The climate of Cuttack, judging from the health of the residents for a period of nearly six years, may be considered on the whole healthy, the sickness witnessed among Europeans being for the most part traceable to fevers, &c., contracted in the neighbouring hills on duty. For two weeks during the hot weather in May the heat is excessive. The cold weather is very pleasant, the lowest range of the thermometer being between 55° and 60°. No admixtures, such as dust, &c., affecting the atmosphere, are experienced in the vicinity. No extraordinary precautions regarding diet, shelter, clothing, drill and duty are required at this station. The most healthy months are December, January, and February, and the most unhealthy May and June in the dry seasons, and when the pilgrims to Juggernauth are numerous, during which period cholera and small-pox rage, and September and October during the rains when fevers prevail. 4. Pooree or Juggernauth, 53 miles due south on the sea-coast, is more healthy than the station, but only in the hot months, March, April, May, and the first 10 days in June, owing to the south-west monsoon. It is not, however, adapted for a permanent residence, owing to the relaxing nature of the climate. 5. I have served at Pooree and Cuttack, but the latter station is superior in a sanitary view, owing to the reasons above given.
III. SANITARY CONDITION OF STATION.	1. 2. A map of the adjacent country and plan of the station are transmitted. 3, 4, 5. There are no barracks in use at the station; but in the vicinity there is a low range of dome-roofed buildings, formerly occupied by European cavalry, and now made over to the military police. 6. The Madras sepoy sleeps on the bare ground, sometimes with a mat, and his coat between it and him; now and then he provides himself with a country cot—in Burmah and the Straits invariably. 7. The Madras private native tent is a very simple structure; a cross pole on two uprights in the centre, from which fall the folds in oblong form, containing by regulation 25 men and their arms. Their length is 22 feet by 12 feet broad along the ground inside; the height of the upright poles is 10 feet, and length of the cross-pole 10 feet. 8. The tents are open all round below and at the entrance, and cannot be sufficiently shut down in wet weather. Huts and guard-rooms are well ventilated both by day and night. The ventilation of the tents is always sufficient, and at times too great.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	9 to 16. No barracks at Cuttack. The native hospitals are reported by the medical officer to be dry. The station is considered particularly free from foul ditches or other receptacles of noxious matter, with the exception of those noted (Question 11, Topography). 17. Defects in the state of the surface cleansing of the cantonment have been lately considerably removed, and, unless at very great expense, little more could be done. 18. The surface of the cantonment is kept particularly free from vegetation; hedges are kept at the regulation height, and neither these nor brick-walls interfere at all with ventilation. 19. The cantonment bazaar occupies the highest ground in the station, and therefore possesses facilities for drainage. It is thought, however, that the most has not been made of these, and that the sanitary condition, with reference to ventilation and crowding, is not so perfect as it might be. The water supply is abundant. No written bazaar regulations are found existing at this station. Some simple regulations, as far as lies in the power of the commanding officer to frame, will be made for the preservation of cleanliness, the prevention of crowding, and for the general conservancy of the cantonment. Upon the whole, however, the abodes of the natives are as cleanly as may be seen in any Indian town. 20. About 15 sheep are daily killed near the bazaar; this is certainly a nuisance, and a more desirable spot will be selected as soon as possible for a slaughtering place. 21, 22. There are no bazaar horses, nor artillery nor cavalry stables. The Karkhana bullocks have a good shed, and are kept very clean and sweet. The manure is sold. 23. No reply to this query.
Officers' Quarters.	1. The officers' quarters consist of ranges of thatched bungalows, situated in spacious compounds on the high banks of the river. The drainage is natural, and the ventilation free. No improvement in them can be suggested.
IV. Health of the Troops.	1. I am of opinion that the station district and adjoining native population are on the whole healthy; and when cholera and other fatal epidemics appear, they are traceable to the numbers of pilgrims who pass through this district on their road to Juggernauth. 2. The most prevalent diseases among the native population are cholera, elephantiasis, and enlargement of the spleen, dependent on fever. 3. The cheapness of the necessaries of life, proximity to the sea-coast, and abundance of good water throughout the year, make the district healthy. 4. The native infantry regiment at present in this station came from Russelcondah, where they had been about one year and ten months. The regiment left for Cuttack on the 1st December 1859, and arrived on the 19th of that month. The most prevalent diseases at Russelcondah were fevers and rheumatism; but there appears to have been no unusual amount of sickness. On arrival at this station they were in good health, and the principal diseases since that time have been fevers, rheumatism, and bowel complaints. I am not aware of any portion of the accommodation here being more unhealthy than others. 5. The troops are not camped out. 6 to 17. No experience of hill stations. 18. I have not had sufficient experience to say which is the healthiest class of surface and subsoil for stations. 19 to 24. No replies to these queries.
Diseases.	1. Inspection parades for the discovery of incipient diseases are not usual among native troops. 2. No scorbutic disease has been seen by me at this station. 3. Very few cases of hepatic disease come under treatment here, and those which do occur are chiefly secondary to fever, and therefore, the prophylactics adapted to the latter would be best. 4. Dracunculus is not seen at this station. 5. The average of venereal diseases usually under treatment is about 3 per cent. of the total in hospital. It would be highly advantageous in my opinion to have lock hospitals at every military station. 6. At this station diseases of the endemic or epidemic class, with the exception of fever and rheumatism are not frequently met with. Intermittent fevers are most prevalent; dysentery cases are few in number, and small-pox seldom prevails among the troops, as they are generally protected by vaccination. Cholera is rare, only one case having occurred among the troops during the last two years. There are no statistics available from which to furnish the proportion of admissions and deaths from these diseases to the total of admissions and deaths. 7. Intermittent fevers, the only zymotic diseases generally prevalent at this station, present no unusual nosological character. These diseases are usually most prevalent after the commencement of the rains, and in the cold seasons, and are usually preceded and accompanied by cold and dampness of the atmosphere. The sanitary condition of the bazaar is good in every respect, and I am not aware of any personal habits among the troops or native population which appear to predispose to these diseases. 8. This query is chiefly applicable to European troops of which I have no experience. 9. Quinine is not usually used as a prophylactic against malarial disease. 10. Ordinary attention to drainage, cleanliness and other sanitary requirements, appears to be all that is necessary to prevent, or mitigate epidemic disease at the station.
V. Intemperance.	1. The native soldier is very temperate in general; there is not a confirmed drunkard among them, nor among the drummers and band men. 2. A sepoy is occasionally drunk and is punished for it. It must be confessed that when separated from their families across the water, a considerable number of sepoys take to drinking, but not inordinately,—though occasionally brought to a court-martial for drunkenness on or off duty. 3. No shop for the sale of arrack or toddy now exists in the cantonment limits. 4 to 11. These queries are left to men more experienced in European troops to answer. It is of no use to add to the immense quantity of opinions that will be forthcoming from other quarters.
VI. Diet.	No information under this head.

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References to Subjects and Queries.	REPLIES.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. This question has evident reference to European soldiers. The dress of the sepoy cannot be altered for the better, taking all things into consideration. His commanding officer sees that he is clothed suitably to the season of the year, and still according to the regulations. The sepoys' carpet and greatcoat improvise sufficient protection against sudden changes of weather by day or night.
Duties.	1, 2, 3. At this station, as regards drill, the natives are out mostly in the morning, with parades for inspection, &c. in the evening. As respects duty, the sepoy here has four nights at home, and the night guards have no particular effect upon him. The treasury guard is two miles from the lines commanded by a native officer.
VIII. INSTRUCTION AND RECREATION.	1. Cricket is somewhat affected by the sepoys, and much encouraged by some of the European officers. An English school for the sepoys has just been commenced. The master is a certificated one and 2nd master of the Cuttack Government school. 2, 3. No reply to these queries. 4. The native troops are well furnished at this station with sheds for exercise, and shaded by trees.
IX. MILITARY PRISONS.	1. The solitary cells (three in the fort) are clean, well ventilated, with nothing in them to prejudice the health of the sepoys placed in confinement, which is never for more than seven days at a time.
X. FIELD SERVICE.	1. There are no special local regulations for field medical service. 2. Although the medical officer is of the greatest importance on the line of march, and in the field as regards his professional duties, yet his powers do not go far, because in a line of march the course is stereotyped, and there is no room for change. In the field everything depends on the commanding officer. As regards the appearance of epidemics in the camp, the advice of the medical officer may be said to be authority. 3. In India, it is difficult to find any other than the encamping grounds where regiments, year after year, have pitched their tents. These have been selected with the greatest care, by the quartermaster-general's department, with reference to openness, sufficiency of space, and supply of water. The medical officer can do no more than call upon the commanding officer to keep the camp clean; which is enjoined by regulations with ample detail of instructions. 4. No reply to this question.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information on this subject.
XII. HOSPITALS.	1, 2. The hospital is situated at some distance from the bazaars, on an open and somewhat elevated site. It is freely ventilated, favourably situated as to drainage, and free from sources of malaria. 3. The water supply is abundant and wholesome. 4. The drainage and sewage from a native hospital are small. 5. The ward is raised about 2 feet from the ground; but has no arrangement for the perflation of air beneath the floor. The roof water is carried off and sinks into the subsoil. The drainage is amply sufficient to carry off the fall of rain. The hospital is pucka building, with a thatched roof, which, as well as the walls, is single. They do not admit of ventilation between them; but the walls are sufficiently thick to keep the hospital cool. It is surrounded on all sides by broad verandahs amply sheltered from the sun by bamboo tatties; these are occasionally used for the accommodation of sick and convalescents.

TABLE of Hospital Accommodation.

Date of construction, 1833.
Total number of wards, 1.

Total regulation number of beds, eight per cent. of the strength of the corps: in case the sick exceed this number, the men are allowed to bring their own cots (*vide* D. P. W. Code.)

Wards, Number.	Regulation Number of Sick in Ward.	Dimensions of Ward.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
One long apartment, measuring 118 feet in length and 22¾ feet in width.	Can accommodate 40 comfortably.	118 feet.	22¾ feet.	Between floor and ridge plate 20 feet. No ceiling.	42,762 ft.	1069	92	16 inches	16	7 feet	4 feet

The prevailing winds blow over the hospital. The windows afford fair ventilation and open by an upper and lower compartment.

6. Ventilation is effected by means of the doors of windows which surround the hospital, and also by means of openings in the roof which are sufficient to preserve the purity of the air in the ward. There are no jhilmils.
7, 8. There is no apparatus for cooling or warming the wards. The walls of the hospital are whitewashed twice a year.
9. There is one privy situated close to the hospital on the west side; a pucka building, with openings in the walls for the admission of fresh air. There is proper drainage, and it is flushed with water several times a day, by which means it is kept pure.
10. No lavatory arrangements exist in native hospitals.
11. There is a tank for bathing in front of the hospital, and an abundant supply of water for warm baths when required.
12. The means for washing and drying hospital linen is provided for by the commissariat agent.
13. No storage at this station.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	14. The bedsteads used in hospital are the common wooden charpoy of the country. The bedding is sufficient; but the number of cots allowed is insufficient for the hospital at this station. 15, 16. These questions apply to European hospitals only. 17. There is an hospital havildar for attendance on the sick, and orderlies are supplied by the commanding officer on the requisition of the medical officer. 18. The sanitary condition of the hospital is on the whole good, and no epidemic disease, hospital gangrene, or pyæmia have appeared in the wards. 19, 20. Nothing to suggest in reply to the queries. 21. The sick wives and children of soldiers are attended by the medical officer, whenever Sepoys make the request. 22. Only the Presidency Medical Regulations are enforced as a general rule;—special ones are issued when necessary. 23. Medical officers as a rule have the full co-operation of the commanding officer in regard to matters appertaining to the sanitary state of the hospital, to repairs of buildings, &c. 24. There is no ward or hospital for convalescents; but such provision for convalescent patients would be highly advantageous at all stations.
XIII. Burial of the Dead.	1. The cantonments burial ground for the use of the European community is situated on the bank of the Mahanuddy, half a mile to the westward of the cantonment. The prevailing winds do not, however, blow over this ground in the direction of the station. 2. The area of the burial ground is 62,712 square feet. The soil and subsoil are light alluvium, and the drainage is effected naturally owing to the position on the high river bank. The ground is carefully kept in order, under the superintendence of the chaplain. 3. The usual space allowed for graves is 3 feet by 9 feet; but more is generally taken; the interval between them is 3 feet, and the required depth not less than four feet. Graves are not reopened unless vaulted, and no bodies have been interred above previous interments. There is no compulsion as to time of burial; but it generally takes place at ordinary times within twenty-four hours after death, and during epidemics as soon as preliminaries can be effected. In native burial grounds the corpse is interred within three hours of decease, often sooner, such is the custom of the Mahommedans. 4. The graveyard has never been found offensive. 5. The Hindoos burn their dead at the river far from the cantonment—the Mahommedans bury their dead at once, four or five feet below the surface, in a burial ground within the cantonment, used under the Mahratta government. 6. Notwithstanding that the Mahommedan burial ground has been buried over four or five times, no injury has accrued to the public. They (the Mahommedans) do not disturb ground in which bones can be found. 7. The government and no other authority might regulate burial grounds. All burial grounds should be at a distance; but this cannot easily be effected in the case of Mahommedans. However, the Mahommedan burial ground in the cantonments, and also that appropriated to R. C. native Christians are being closed, and new sites considered for them at a distance.

(Signed) C. M. Macleane, Colonel,
Commanding troops, Cuttack.
John C. Harris, Captain,
Superintending Engineer, Cuttack circle.
R. Pringle, M.D., Assistant-surgeon,
In medical charge, Civil station.
Thomas Croudace, Assistant-surgeon,
In medical charge, Military station.

May 31st, 1860.

LABUAN.

Accommodation. Native Troops { Artillery. 2 Jemidars, 10 rank and file. / Infantry. One company of a native regiment.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country to the south of the station consists of clay hills intersected by ravines, forming a fine natural drainage, while to the north and east is a sandy flat covered with thin vegetable soil, below which is sandstone. The barracks and hospital are built at the edge of the sandstone plateau. The lines themselves comprise a space of cleared ground of about 40 acres, surrounded by jungle and forest, the former of which abounds in the settlement; the other portion of the island being covered with large forest. Some of it is 300 feet high. 2. The elevation of the station above the sea is 108 feet. The ground on which the lines stand is the highest of a series of undulations, which gradually diminish in height until half a mile distant, to the south and south-east, where they terminate at a plain which occupies the remaining extent towards the harbour and bay. The plain varies from 10 feet to 2 feet above the sea bed, and is in some parts submerged at high tides. To the north and west the primeval forest overtops the cantonment from 50 to 200 feet on all sides. A tolerably large river extends down the centre of the island from north to south. The low land forming the northern boundary of the harbour was originally almost entirely swamp, a considerable portion of which has been reclaimed between the lines and harbour, but much yet remains to be done. There is no higher or healthier ground in the immediate neighbourhood of the cantonments than that on which the station stands.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	3. The highest ascertained elevation on the island is merely a narrow ridge, 300 feet high, at the north-east end of Labuan. It is distant about six miles from the station. 4. The island of Labuan which is about 30 miles in circumference contains numerous streams flowing to the sea, which overflowing their banks, form numerous swamps in the interior. The harbour to the south and south-east of the lines is distant about 1½ miles by the road. The sea approaches to within a mile and a half to the north and north-east, the intervening space between it and the station being filled with jungle and forest. The vicinity of the station is not liable to overflow. The ravines which exists near the lines have been lately cleared from secondary jungle, and the health of the troops has been thereby materially improved. 5. The station is generally open. The forest referred to approaches to within about 800 yards of the lines to the south and west, but as the forest is very close, and consists of trees averaging 200 feet high, which effectually prevent any dense undergrowth, its proximity is probably an advantage as it does not inconveniently intercept ventilation, yet prevents the approach of malaria from the swamp beyond. The temperature of the station is not raised by the buildings being exposed to reflected sun-heat. The north-east monsoon which blows for three months, and the south-west monsoon which lasts for six months, are the prevailing winds to which the station is exposed. These breezes refresh the European resident, and contribute essentially to the coolness of the climate, but the Indians, from want of proper clothing become chilled by them, and they often cause a recurrence of fever and ague. 6. There are no works of irrigation near the station, and there is no cultivation of either rice or indigo on this side of the island. 7. The town of Labuan, principally inhabited by Chinese and Klings, is situated close to the harbour about two miles from the lines. 8, 9, 10. No replies to these queries. 11. The water supply of the station is derived from wells, no tanks of any description existing in the settlement. 12. The water obtained at the station is good, but in the dry season there is sometimes difficulty in procuring sweet water, as deep wells have not been dug near the lines; good water is, however, procurable at a short distance. [*N.B.* Since the above was written, a deep well has been sunk at the lines, which it is expected will give a never-failing supply of water.] The water at all seasons is wholesome. It is raised from the wells for distribution by buckets. 13, 14. No replies to these queries.
II. CLIMATE.	1. The instruments available for meteorological purposes here are a common thermometer, and a rain gauge at the hospital. 2. The following is a table of meteorological observations and irregular remarks extending over a period of nine years. The partially correct remarks are made from 1st May 1858 to 30th September 1858; the more correct observations being from 1st January 1860 to 30th April in the same year.

Months.	Barometer Mean.	Mean Temperature at Noon.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Dew, Wind, Storms, &c.
Jan. -	None in the station.	82°	10°	87°	77°	All observations have been made here by the dry bulb as just given.	Not used here.		*3·25	N.E.	Moderate occasional high winds during 3 months.	Sun is seldom observed for a whole day. Rain generally falling at night.	An entirely cloudless sky is seldom seen here, although the days of entire observation are comparatively rare—heavy rain generally falls at night, so much as 4 inches have been known to fall in as many hours. The monsoons are steady and strong, frequently interfered with by the land and sea breezes during the early part of the day; towards afternoon the monsoon generally resumes its force; thunder storms are frequent and severe about the season when the monsoons change, and occasionally at other times, attended with heavy squalls of rain and wind, but seldom lasting more than an hour at a time.
Feb. -		83½	9½	88	79				4·75	N.E.			
March		83	14	90	76				3·5	N.E. and variable.			
April		83	12	89	77				12·5	Variable.			
May -		83½	17	92	75				4·0	Variable S.W.			
June -		Mean during the year may be taken at 84°.	Mean during the year may be safely taken at 12°.	Mean maximum during the year may be taken at 88°.	Mean minimum during the year may be taken at 77°.				14·80	S.W.	Brisk monsoon.		
July -									13·4	SW.			
Aug. -									2·43	S.W.	Occasionally high squalls from South.		
Sept. -									6·47	S.W.			
Oct. -									7·22	S.W.			
Nov. -									8·89	Variable N.E.			
Dec. -									17·97	N.E.	Typhoons to the North, seldom more than the "tail end" reaches Labuan.		

* This fall of rain is unusual for January, which in some years has been so dry that water was with some difficulty procurable, but when such has been the case December or some other month has made up the difference, so that the yearly average holds good, viz., 130 to 200 inches a year.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. Like all equatorial regions the climate is moist, and the air for the greater part of the year much saturated with moisture, but while the north-east monsoon blows the air is dry and the general health of the inhabitants and troops materially improve. At all seasons vegetation is rapid and the grass evergreen. The great amount of sickness amongst the troops for the last few years has caused the duties to fall heavy on the remaining few, who were themselves debilitated by the same disease, so that extra drills or duties, except those absolutely necessary, would be injurious at a very unhealthy season when upwards of 70 men were unfit for duty. The guards were obliged to stand for two or three consecutive days without relief. On such occasions, which happily seldom occur, the necessary parade of arms cleaning is all that can be expected. The troops at Labuan receive sea rations, which are forwarded by the Commissariat at Singapore, salt fish has not been received lately, the voyage spoils it; and the compensation received is not sufficient to buy fresh fish daily. The experiment was tried of introducing a breed of goats on the personal responsibility of the Commanding Officer, but on account of the great price and small number procurable it failed to be of much benefit. Warm clothing is most essential to the climate, and it has been found most conducive to health that the men should mount guard in their red jackets; but what is in my opinion most essential is a more substantial ration. If fresh fish was issued to the men daily, and the men enabled to purchase goats at a reasonable price the object would be attained. There can be no doubt that a body of men not hampered by caste prejudices are the best for service at Labuan. The most unhealthy months at this station are July, August and September, the months of November, December, January, and February being the most healthy. The returns for the last eleven years show that no reliance can be placed on any data which affix a healthy or unhealthy character to any particular months. The months which one year have been most healthy have proved directly the reverse in another, but, so far as a rule can be laid down, the period of the south-west moosoon is said to be the most healthy. I should say, however, that any season which affords just enough rain to keep the pools and puddles damp is the most unhealthy, excessive rain or heat being both healthy. Fever is the prevailing disease during the unhealthy months and is attributable to the miasma of the marshes adjacent. 4. I cannot say whether there is any more healthly district than that of the station in the neighbourhood, but I believe a residence at any of the points marked respectively 1, 2, 3, 4 and 5, (on the sketch accompanying the original) in their order of merit would during the season when the wind comes off the sea in the particular directions be perfectly healthy. Four of these districts are entirely uncleared at present, but the extent of forest is small. No. 1 (north) would be best in the north-east monsoon; No. 2 (south-east) in the south-west monsoon, and both would have the full advantage of the land and sea breezes, which blow nearly north-west and south-east. All except No. 5 (south-west) present sandstone cliffs of 30 to 50 feet in height at the sea beach, rising gradually inland. No. 5 rises gradually from the beach to about 80 feet in a central ridge. 5. Assistant Surgeon Fraser was at St. Thomas' Mount for three months, the climate of which is moderately healthy. He was in the Indian navy for two years; at Singapore four months for native troops; Labuan 13 months. This station has been extremely unhealthy as regards the prevalence of fever, but I attribute this entirely to the fact that a large portion of the settlement is covered with dense secondary jungle, decaying (felled) forest trees and swampy ground. Immense improvements have, however, been made within the last three years, and the works this last year appear to have overtaken (so to express it) the deleterious influences; and should they progress as rapidly as I have no doubt they will do, a year or two years more will see the settlement perfectly healthy, the climate being the most salubrious I ever have experienced.
III. Sanitary Condition of the Station.	1, 2, 3. A plan of the cantonments showing the position of the various buildings, &c. is transmitted. 4. Table of Barrack Accommodation. Date of construction, 1850. Total number of rooms - - 4. Total regulation number of men - 161.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Men's Beds above the Floor.	Doors and Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		Ft.	Ft.					Ft.		Ft.	Ft. in.
1 -	42	100	16	Centre 16 ft. Sides, 10 ft.	20,800	495	39	3	8	7	3 6 With a small window at each end of the building 3 ft. by 4 ft.
2 -	42	100	16	Do.	20,800	495	39	3	8	7	3 6 Do. do.
3 -	42	100	16	Do.	20,800	495	39	3	8	7	3 6 Do. do.
4 -	35	100	16	Do.	20,800	594	46	3	10	7	3 6 No windows.
Total 4 -	161	—	—	—	—	—	—	—	34	—	
Guard Room	One guard-room for 12 men.	25	12	10	3,000	250	25	None.	4	Doors. 7	3 6
Prison Cells	One solitary cell.	10	10	10	1,000	1,000	100	None.	1	Door. 7	3 6

LABUAN.
MADRAS.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of the Station—*cont.*	5. There is one small window at each end of each building, and four doors on each side opposite to each other. Verandahs are placed on either side of the barracks, but they are never used as sleeping quarters by soldiers or other persons. The buildings are supplied with properly constructed jalousies and jhilmils. 6. Broad cots are used for sleeping purposes in the barrack. 7. There are no tents in use at Labuan. 8. The barracks, &c., are ventilated by the doors and windows, which are sufficient to keep the air pure by night as well as by day. No artificial means are in use for the purpose of cooling the barrack rooms. 9. The barracks are constructed of attap and boarding. 10. The floors, which are boarded, are raised 5 feet from the ground, and admit of a free passage of air beneath. 11. The materials used in the construction of the barracks, &c., are suitable to the climate. The buildings in the cantonment are kept in repair by the government of Labuan, through the Colonial Surveyor. The Commanding Officer is responsible for the general sanitary state of the cantonment. The barracks have walls of kadjung (leaf of palm); but since the above was written boarding has been fastened round the barrack rooms, and the old walls removed. 12. There are no lavatories or washing places for the men. 13. The cook-houses are under one roof, the building being constructed of attap and bamboo with kadjung roof of attap or leaf of palm. The water for culinary purposes is procured from a well close at hand. There are no places erected for washing and drying linen. Native dhobees or washermen wash the clothes at the streams in the usual Indian fashion, and dry them on clothes lines or bushes. So long as the dhobies are not sick and do their work, the wants of the station are supplied; but often the men are sick, when much inconvenience is then experienced by the troops. 14, 15. There are no privies or urinals attached to the barracks, nor are the latter buildings lighted at night. 16. There are no arrangements for draining or sewering the barracks, except to take off the water from the roof, the natural drainage being sufficient for the purpose. No part of any building used as a barrack or hospital is at all damp. The ditches which existed near the station have been lately cleansed and cleared, and the government are about to thoroughly drain and cleanse the vicinity of the lines; at present, and heretofore, the rain has remained on the surface. 17. The surface cleansing within the cantonments is performed by working parties, who are employed, while the state of the health of the men will permit, to cut down all rank grass and weeds from the parade ground. The latter requires draining in order to permit the growth of good grasses. 18. The surface of the cantonment is kept clear of all vegetation with the exception of grass. It is desirable that cattle should be allowed to graze on the cantonment to keep the grass short. There are no old walls, thick hedges, &c., to interfere with the ventilation of the station. 19. There is no bazaar or native houses at the station. 20. Fowls are killed at the cook-houses, but no nuisance is experienced therefrom. 21, 22. There is no stabling or picketing ground at Labuan. 23. No quarters for married Europeans exist at the station; and natives leave their families in India when on foreign service.
Officers' Quarters.	1. There are no officers' quarters at the station.
IV. HEALTH OF THE TROOPS.	1. Labuan when first settled in by the British, in 1846, was an uninhabited island, covered with a dense forest, and the low country adjoining the harbour was a brackish swamp. Remittent fever of a deadly character prevailed for a long time, gradually becoming milder and assuming an intermittent character, as drainage and clearing progressed, until in 1850–1–2 the station became very healthy. From that time, however, secondary jungle sprung up rapidly, and the large timber which had been cut down in former years became rotten; fever supervened, and increased yearly in severity and extent until in May, June, July, and August 1859 it reached its maximum, since which time the sanitary improvements have overtaken the disease, and give rise to a prospect of the station becoming a healthy one. The native population is healthy. 2. The disease most prevalent amongst the natives is short and mild attacks of intermittent fever, generally accompanied in chronic cases by enlargement of the spleen. In one case (a Chinese) I found the spleen weigh after death 2¾ lbs. (avoirdupois). Fever amongst the Malays is however by no means prevalent, but it is common with all new arrivals, Chinese or Indian. 3. The healthiness of the native population is to be attributed chiefly to the peculiar genial climate, and the almost constant prevalence of a cool breeze, the temperature seldom rising above 83°, nor falling below 76°. The nights are always cool, and the houses, which are all raised on posts from 2 to 4 or 5 feet from the ground, are airy and well ventilated. The floors of these houses are composed either of rough open boards or "lantees" (*i.e.*, stout laths made from the hard nebong palm,) admitting air freely. The frequent extremely heavy showers which carry off the refuse very quickly, also materially contribute to the healthiness of the population, and it may be safely said that life is never shortened by hard work or sedentary employment. The lower class of Chinese inhabiting the greater portion of the town of Labuan are a dirty set of people, and although their houses are for the most part more commodious than those of the Malays, they are not raised nearly so high from the ground as the latter. Quantities of filth also accumulate underneath the former, which the Chinese are very loath to remove when ordered to do so by the police. 4. The troops here were previously stationed at Penang for 18 months, during which time their health was very indifferent. The present detachment arrived here on the 24th April 1859 in an average state of health; several of the troops had had previous attacks of fever, and about four suffered from ill-conditioned ulcers, which, however, soon yielded to treatment. The prevailing diseases among the troops since their arrival have been intermittent and

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	remittent fevers. During the process of clearing certain ravines in their vicinity, the artillery barrack and hospital were, in May, June, July, and August last, very unhealthy; but since then, they have been very healthy. A considerable amount of jungle and waste land remains to be cleared, until the completion of which fever must prevail more or less; but when that time arrives, I believe the station will be probably the most salubrious one in the foreign service of the Madras presidency to all persons who do not purposely visit the swamps in the interior of the island which are now separated from the settlement by an extensive forest, thus effectually preventing the spread of malaria. 5. The troops at the station are never camped out. 6, 7, 8. I have no experience personally of hill stations, but, from the opinion of others, and personal connection, I believe hill stations highly desirable for Europeans, but of questionable utility to natives of India, unless recruited from hill districts. Their utility will also in the case of Europeans depend greatly on age, length of previous residence in the plains, and predisposition to certain diseases, as dysentery, diarrhœa, &c., which in old Europeans, resident for many years in the plains, might be aggravated. To the young and vigorous recruit, however, I believe they would ensure a higher range of health than even a residence in England. 9. The diseases peculiar to hill stations with which troops are liable to be attacked on going to them are coup-de-soleil from incautious exposure to the sun, which some are apt to forget is still tropical; and an aggravation of certain diseases contracted on the plains, as some forms of diarrhœa, dysentery, bronchial affections, &c., but even some of these are benefited by hill residence where the constitution is good. 10. Proper and suitable protection to the head, and avoidance of undue exposure to the sun are the precautions necessary to be observed on going to hill stations in the first case, and in the latter, the use of comfortable clothing, especially over the abdomen and vital organs; moderate exercise, and avoidance of night chills when sleeping are essentially necessary. 11 to 15. No experience of hill stations personally. 16. The range of elevation most suitable for hill stations will depend greatly on the proximity to or distance from the sea, as well as on the local amount of exposure to the prevailing winds. At Penang the hill rising 1,250 feet above the level of the sea, has been found extremely beneficial in many cases of tardy convalescence from tropical diseases, and as a restorative in all cases suffering from climate without real disease. 17. There is no higher or healthier ground near the station in the British territory which could be advantageously occupied as a hill station, but there is a splendid range of hills on the Borneo coast, about 30 miles inland. The country is only inhabited by wild tribes, Kyans, Dyaks, &c. No roads exist, but river communication extends to the foot of the ranges, which rise to about 8,000 feet. The climate has been described to me as excellent. 18. I believe the light sandy loam which prevails over the greater part of this settlement to be very healthy for stations, so soon as it is properly cleared and becomes covered with a firm turf of grass, but in a state of nature it is covered with from three to six inches of loose spongy partially decomposed vegetable deposit, principally roots of ferns and rushes, which retaining moisture emit unhealthy exhalations. 19. British soldiers proceeding to India should be from 20 to 26 years of age. Those destined for Madras should land there from the end of August to the beginning of November, and those for Calcutta in October. With regard to the best period of the year for landing in Bombay I have no experience to speak from. 20, 21. A previous residence at some intermediate station, or at an Indian hill station, would be beneficial before coming to India. 22, 23. A soldier of good constitution may serve 25 years in India, but 10 years with a change to a temperate climate would be better. As a rule 12 years of uninterrupted service ought to be the maximum period. 24. Invalids leaving India for home, if they leave by first-class vessels of 1,000 tons and upwards, such as those of Messrs. Green, Smith, Wigram, and Co., should depart from Madras on the 1st February; in smaller vessels at the end of December; the object being to pass the Cape of Good Hope in summer, and arrive in England by the end of April. Many lives are however lost by having to wait until the detachment embarks, which might have been saved by immediate embarkation, without reference to the time of year; but as this might *often* be impracticable, even if sanctioned, I am of opinion that an hospital ship stationed in the Bay of Bengal, to receive at all times cases recommended for such change of air, would be of incalculable benefit. She might cruise about occasionally and proceed to pick up patients at Madras, the Sand-heads (Calcutta), and Rangoon, avoiding bad weather, which from the known regularity of the atmospheric phenomena in the Bay of Bengal can be confidently achieved. Many cases would thus be cured without sending them to England, and such as were not might be sent in the regular seasons at a time stated. During nearly two years' service in the Indian navy in a vessel constantly carrying sick and effective troops across the bay, I was often struck with the remarkable improvement in many cases, even in a week's voyaging, both in Europeans and natives.
Diseases.	1. No regular inspection parades for the discovery of incipient diseases are held at the station, there being no necessity for them. 2. I am not aware of any case of scorbutus having occurred at this station. 3. Hepatic diseases (as are almost all others except fever) are rare in Labuan. Congestion of the liver occurs in the cold stage of intermittent fever, but rarely becomes serious. As fever disappears with the progress of the sanitary improvements under operation, these cases will become very rare. For several months last year, when I had no quinine, I was obliged to use indigenous remedies of little value, and cases continued to have daily paroxysms of fever, in many instances for six weeks, the liver and spleen becoming seriously implicated; but in cases where quinine is available to cure them in five or six days, such complications are rare and seldom serious. 4. Dracunculus is unknown in Labuan, and, I believe, also in this part of Borneo. 5. Venereal disease is very rare at this station, no case having occurred during the past year. In stations where it does exist I would recommend attention to the very earliest symptoms to be enforced on the men, the non-compliance with which should subject the patient to hospital stoppages during his treatment, but no stoppages should be exacted from such as

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	apply for medical aid immediately on the discovery of the disease. The establishment of a lock hospital *for females* would, I believe, be most advantageous; but some coercion or inducement to enter would be requisite in most cases. Free ration and careful seclusion might be sufficient incentive in many instances, but they would have to be invited or ordered to enter. 6. The troops at the station suffer from diseases of the following class:— *Fevers.*—Remittent fever in unhealthy seasons; intermittent fever, more or less severe, all the year round, but principally amongst such as have had previous attacks. It also attacks all new arrivals. *Dysentery* is rare, and generally occurs as a sequel to fever in debilitated subjects. *Cholera* is unknown. *Small-pox* is unknown. Vaccination has been frequently attempted, but never succeeded. *Rheumatism* is much less common than would be expected in so damp a climate, and where it does occur it generally yields to treatment. 7. Fever in unhealthy seasons generally attacks natives from one to three months after their arrival in Labuan, the attack being ushered in by languor or lassitude, pain in the back and limbs, and often rigors, followed by heat of skin, usually lasting from four to six hours, terminating in a perspiration more or less profuse. The type varies from the severe remittent form, with urgent head symptoms, &c., to mild ague, generally quotidian. These attacks usually recur monthly where quinine is not available in the treatment, and even in obstinate cases where it has been used, the disease often re-appears for several months in succession. The intervals between the extremely dry and wet seasons are the most unhealthy, generally at the changing of the monsoons in May and November; but these phenomena are very irregular and uncertain in Labuan, the land and sea breezes from the Bornean coast often modifying both monsoons. The troops live in four roomy and well-ventilated barracks, which are kept clean. The drainage is imperfect on the immediate area on which the buildings are erected, but deep ravines adjoin, and water soon percolates through the loose sandy soil. The water supply is obtained from streams and shallow wells; that from the former is generally coloured brown from passing through the fern roots, but is wholesome. The habit which all natives of India have of denuding themselves of clothing when cooking their food, &c., is, I believe, prejudicial to the health of the men here, where the climate is so much colder than in India; and the wind, especially towards the evening, is positively cold, making even Europeans glad to put on a woollen coat. At such times the native is often exposed with only the smallest possible vestige of clothing, which practice is likely to bring on fever in predisposed subjects. They are warned against it, but it is difficult to make them understand that a practice which they have adopted with impunity in India all their lives can be injurious here. 8. Native commissioned officers and others exempt from duty enjoy a marked immunity from fever; but the soldier, of course, cannot be so exempted, and the night duties, doubtless, furnish most of the fever cases. 9. I have rarely, until lately, been able to procure enough quinine for the sick, so that I had no opportunity of trying it as a prophylactic against malarial diseases; but I am informed that the late Lieut.-Governor took a dose daily, and escaped fever at a time when no other European in the island escaped, and when the cases were often fatal in three days. In my case it has always checked premonitory symptoms where taken early. 10. I would recommend the adoption of a local corps, recruited from the same class of men as the Madras Sappers and Miners, to be sent here, with their wives and families, on whose presence the comfort and health of the Indian soldier generally depends. These men would in from one to two years become perfectly acclimated; and, as the settlement becomes thoroughly cleared and drained, disease will become exceedingly rare. Under the present system men have been so debilitated and worn out with fever as to necessitate their being relieved every 10 or 18 months, with great inconvenience and expense to the service. Peons, coolies, and others, natives of India, are resident on the island for years, and enjoy excellent health, showing the justice of the above opinion. With such a corps of picked men, and with a due supply of quinine, which has been hitherto sparingly available, as it was supplied with reference to the strength of the detachment and not to the number of fever cases, I should not dread a comparison with the hospital return of any foreign service station of the Madras army.
V. INTEMPERANCE.	1. I believe a large number of the present detachment to be addicted to the use of narcotics, and, for natives, a somewhat large amount of drunkenness prevails; but not to a serious extent. There are, however, no confirmed drunkards among them. 2. Since no amount of irregularity or exposure will *per se* produce true intermittent or remittent fever without the presence of malaria, none of the cases admitted to hospital in Labuan can be with certainty attributed to intemperance; but it is obvious that a drunkard or opium eater is a bad subject for fever, especially the severe remittent type, when head symptoms are so serious, and may predispose to its invasion. Drunkenness is always punished as an offence. 3. Spirits are sold at the bazaar and arrack farms, but there are no means of judging of its quality or the amount consumed by each man. Cases of drunkenness are not common except about pay day. Spirit is no part of the soldier's ration here, either at the station, on the march, or in the field. It is never given as a ration to convalescents, although it is sometimes (but very seldom) given medicinally. No drinks other than distilled spirits are sold at the bazaar, but opium and ganjah (cannabis indica) are vended there. 4. The consumption of spirits by troops and convalescents is, as a rule, injurious. 5. It would be beneficial to abolish the spirit ration for soldiers, and to restrict the sale in the canteens and bazaars. 6. The use of good malt liquor to persons taking regular exercise is tolerated by the system, and may sometimes be beneficial, especially to persons habituated to it: but any tendency to hepatic congestions or redundancy of bile is aggravated by its use. Wines, if good, would be comparatively harmless, but being generally spirituous adulterations I consider them bad.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	7. I have no means of knowing whether tea, coffee, lemonade, soda water, and similar drinks, are much used at the station, but the first four are plentifully procurable, and limes may be had for the plucking. These are all most beneficial in their influence on health, efficiency, and discipline, whereas spirits and malt liquor are often positively injurious. 8. This query does not apply to Labuan. 9. The encouragement to the sale of beer, coffee, tea, lemonade, &c. would probably work beneficially without the absolute prohibition of the sale of spirituous liquors as men naturally desire most what is prohibited, and generally find means to procure it. 10. The only recommendations which I have to make on these points are given in the preceding replies to queries, but as at present constituted the whole of the remarks on this subject are scarcely applicable to Labuan. 11. No bazaar or canteen regulations exist at this station.
VI. Diet.	1. "Sea rations" are issued to natives as per table following. On arrival of the stores at the station the Commanding Officer appoints a committee to examine them, and report on their condition and quality.

Table of Daily Rations for Native Troops (Public and Private Followers) on Foreign Service.

Articles.	Quantity. lbs.	oz.	drs.	Amount. rs.	ans.	p.	Remarks.
Rice - - -	1	8	0	0	0	$9\frac{1}{4}$	
Dhole - -	0	3	0	0	0	1	
Salt - -	0	1	0	0	0	$0\frac{3}{4}$	
Ghee - -	0	2	0	0	0	$6\frac{1}{2}$	
Tamarind -	0	2	0	0	0	1	
Curry stuff * -	0	0	12	0	0	1	
Garlic - -	0	0	1	0	0	$\frac{1}{16}$	
Onions - -	0	0	4	0	0	$\frac{3}{16}$	
Beetle nut - -	0	0	8	0	0	$1\frac{1}{2}$	
Tobacco - -	0	1	4	0	0	$1\frac{1}{2}$	
Salt fish - -	0	2	0	0	0	$5\frac{1}{2}$	
Total -	—	—	—	0	2	$4\frac{1}{4}$	

Remarks.	lbs.	oz.	drs.
* Chillies -	0	0	6
Pepper -	0	0	$2\frac{1}{2}$
Turmeric -	0	0	$1\frac{1}{2}$
Coriander -	0	0	1
Cummin -	0	0	1
Total -	0	0	12

	The proportion of vegetables entering into the constitution of a ration is about four-fifths of the whole. 3. The substitution of fresh fish or meat for salt fish to the men at this station would be a great improvement. There are orders prohibiting the disposing of the rations by the troops. 4. There is here a commodious building, subdivided for the different castes, in which the men cook their victuals in their own way. A special cook-house has been erected for the hospital in lieu of the old one pulled down. These kitchens are well ventilated, and are plentifully supplied with water from an adjoining well and the river, except in the dry weather when it is obtained from a greater distance. The men cook their food as they please, and generally have it boiled or stewed with curry. When overworked, owing to a large number being in the hospital, the men have complained of not having time to cook their victuals, there being no one to do it for them. I have known instances of men stating they were without food a whole day, and I have seen rice very imperfectly boiled, which they had to eat. In India this could not occur, as their families would cook their food for them. (Vide answer to No. 15, "Hospitals.") 5. With a permanent local corps, soldiers' gardens might be very advantageously established in the vicinity of the lines, and the labour would be most conducive to the men's health. Seeds should be supplied by Government in the first instance. With detachments, however, frequently removed as at present, it would not be desirable to establish gardens.
VII. Dress, Accoutrements, and Duties.	1. The dress of the soldiers at the station consists of red cloth jacket, black cotton trousers, and pugree, which are suitable for the climate, and for the soldiers' duties by day and night at the different seasons. I have no experience to enable me to state what improvements in the soldiers' dress would diminish the effects of sun-heat, cold, malaria, &c.
Duties.	1, 2. The routine of a soldier's duties here consists of guard-mounting every second day. The men have on an average one night in two in bed during the week. 3. Guards are mounted from 1 to $1\frac{1}{2}$ miles distant from barracks. There is a roll-call at 8 o'clock, p.m.
VIII. Instruction and Recreation.	The queries under this head do not apply to Labuan.
IX. Military Prisons.	1. There is a well-constructed solitary cell in the cantonment, but not being often required, it is used as a store by the Ordnance department; prisoners are kept in the guard-room.
X. Field Service.	1. There are no local medical regulations in Labuan. 2. The medical officer has no power on the line of march in the conduct of the line of march, camping, &c., unless by courtesy. 3, 4. No replies to these queries.
XI. Statistics of Sickness and Mortality.	Not applicable to Labuan.

References to Subjects and Queries.	Replies.
XII. HOSPITALS.	1, 2. The hospital is situated on a small hill continuous, on its western side, with the plateau on which the barracks are built, and sloping down on its three remaining sides into deep ravines. The artillery barrack and guard-room is about 150 yards to the westward, and the infantry barracks are about 300 yards further off in the same direction. There is no bazaar in the neighbourhood, and only one private residence—that of the Surveyor-General—about $\frac{1}{8}$th of a mile off to the north. The site has been rendered, during the past year, by the removal of jungle, &c., open and well ventilated; and the hospital, outhouses, cook-house, &c., have been built on the side of the ravine at such a depth that the roofs do not intercept the ventilation, the ridges being on a level with the ground floor of the hospital. The ravines or nullahs were very unhealthy last year, but have been for the most part carefully cleared. What remains to be done is at some little distance to the east, which will be completed shortly; the site will then be as salubrious as possible. 3. Water is brought to the hospital daily by the bheesties. The supply is abundant, and it is wholesome in quality. 4. There is scarcely any refuse water or impurities, but a deep ravine immediately to the rear, about 50 yards off, carries away all the water that does not percolate through the sandy soil. 5. The hospital is a single flat building, the floor being of planks, having brick walls as a groundwork rising two feet above the ground. Openings are left at the intervals in the wall, whereby a free current of air passes under the flooring; gutters are dug all round the hospital for carrying off the water, which falls from the roof, but a good deal must, from the loose nature of the soil, sink into the ground, but producing, however, no inconvenience. The gutters immediately under the eaves communicate with larger drains before and behind, which again carry off the water rapidly into the before-mentioned ravine. The foundation and basement of the buildings consist of brick walls upon which to receive the beams and flooring. The framework and outside walls are of wood having the inner walls and ceilings made of lath and plaster whitewashed. The walls are consequently double with air between, and are admirably adapted for the climate. The roof is of attap, a species of thatch made from the leaves of the palm. There are verandahs 1 ft. 6 ins. deep nearly all round (the corners being occupied by small rooms, dispensary, guard room, store room, &c.,) and afford sufficient protection from the sun; I have been obliged to use the verandahs for the accommodation of the sick when the number of patients were too great for the wards to contain. The hospital consists of one flat divided into two wards, with dispensary and guard room, and two small store or spare rooms.

TABLE of Hospital Accommodation.

Date of Construction. First occupied, 21st October 1854.

Total number of wards	2
Total number of beds	29

Number of Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		No. 1 Ward, 17 beds.									
2	The hospital is much larger than the strength of the detachment is entitled to, so that it cannot be said to correspond with any "Regulation." It holds conveniently 30 to 40 sick.	Ft. 38	Ft. 17	Ft.in. 11 10	Cubic ft. 7,641	Ft. 450	38	Ft. 2	12 doors; no windows.	Ft. in. 7 6	Ft. in. 3 2
		No. 2 Ward, 12 beds.									
		28	17	11 10	65,225$\frac{1}{3}$	470	39$\frac{1}{3}$		A similar door between the wards.		

N.B.—It has frequently happened that the number of patients has far exceeded the number of beds, in which cases the extra men have slept on the floor between each bed and some in the verandahs. Upwards of 60 men have been thus accommodated. When the number has risen above this as many as were well enough were made out-patients, and lived in barracks. On one occasion last year half the artillery barrack was used as a supplemental hospital, the sick list amounting to 87.

The hospital is so placed as to receive the full benefit of the prevailing winds. There are no windows in the building; but in their place are doors, the upper half of which is fitted with jalousies made to open or close as desired. The arrangement is an admirable one and much better than windows.

6. No artificial means of ventilation are required for the wards, the 12 doors, which are only closed when the weather demands it, being ample, and keep the wards at all times freely ventilated. Each aperture in the door panel has 14 pieces of board, fitting into sockets at each end, so as to open and close (overlapping each other closely when shut), the motion being regulated by a central bar of wood attached by hinges or staples to each venetian.

7, 8. The employment of any artificial apparatus for warming or cooling the wards is not adopted at this station. The walls and ceilings of the building have been cleansed and limewashed twice within the year I have been in medical charge.

9. A privy is in course of erection for the use of the hospital about 15 yards from the wards. Hitherto, and at present the wretched system, too common in India, with natives prevails of going to the nearest secluded spot (or at night, any convenient place) for purposes of nature. The new privy will consist of a deep well, sunk into the ground on the edge of the hill, having a communication at the bottom with the side of the ravine from whence, at regular intervals the ordure will be removed in carts; quicklime also will be frequently thrown down the pit so as to obviate any offensive smell.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	10. There are no lavatory arrangements beyond the use of a pail or tub for the sick; caste prejudices rendering the erection of baths nugatory. 11. The only means of bathing here available is to order the patient to go and bathe, which he does in the nearest stream. In the case of a warm bath, he or his orderly, if one is required, pours warm water over his body instead of cold water. In bad cases hot pediluvia and fomentations are supplied in the ward by the hospital attendant. 12. Indents signed by the Medical Officer are sent in to the Commissariat Agent, who gets the hospital clothing, &c. washed, and returns it clean for re-issue. 13. The storage is sufficient. 14. Only a regulated number of beds are allowed for native hospitals, such allowance being based on the numerical strength of the regiment or detachment, but in Labuan the average amount of sick has usually so far exceeded that of even a full regiment that the local government have supplied several beds over and above the authorized complement. Of the beds in use some also belonged to a detachment of European artillery at one time stationed here. Thirteen of the bedsteads are of iron with boarded bottoms over the iron bands. Four are of wood with tape bottoms, the remaining 12 being entirely of wood, and answer every purpose desired. Indents have been sent in this month for new bedding, the old being worn out. It consists of palliasses made of cotton, fashioned exactly like large pillow cases, in which dry grass is put to form a mattrass; this grass is thrown away and changed as often as necessary, and the palliasses washed. A double pillow case, the inner one stuffed with grass, when required, so as to form a pillow, is also supplied, as also a cumblie made of coarse blue or striped cotton, lined with white cotton and quilted. These appear to answer the purpose very well. 15. To the north and about 25 yards distant from the wards a new cook-room has just been completed, built of wood, with attap roof, on a ground-work of brick. The men cook their food in their own chatties and vessels in the native manner. This system is, however, a very bad one, as every patient, unless absolutely unable to move, (in which case he has a friend or orderly of his own caste to do it for him), cooks his food as he chooses, in consequence of which that valuable adjunct to treatment afforded by regular, well-cooked, and suitable diet is almost entirely lost to the medical officer who treats disease in the native. In India this is not nearly so much the case, as the men's wives or relatives supply their wants; but on foreign service it is a most serious evil, for which the only remedy I can suggest is the appointment of high caste men as cooks, which is the practice on board a ship when native troops are embarked. The prejudices of caste would thus be met, as no native could refuse to take food cooked by a man of equal or superior caste to his own, and a little experience of the system would convince them of its advantages; for the native, although generally slow to afford assistance to the sick, is glad enough to avail himself of aid when sick himself. 16. Diet tables, &c., are forwarded. 17. The provision for attendance on the sick is as follows:—A havildar acts as hospital orderly, and is supposed to exercise general supervision, and to see that the internal economy of the hospital goes on properly; and in such cases as require it, an orderly is specially appointed to wait on them. Nursing, however, as understood in England, may be said to be unknown, it being rare (in my experience) to find an orderly who really attends to the patient, or who even understands how to do so properly. In many instances I have had to complain of shameful neglect, and in very rare cases have I had reason to feel that the orderly had done his duty. Owing to the system of caste I cannot suggest any plan for remedying this crying evil, other than the severe punishment of such orderlies as fail to do their duty. 18. With regard to diseases arising from the condition of the hospital. Four cases of fever occurred last year in patients under treatment for ulcer who could scarcely have contracted the disease out of hospital. One in particular was taken from the vessel in which he arrived at the hospital and never left it. I attributed these cases to the exhalations emanating from the adjacent ravines during the process of clearing, as since their completion no new cases have occurred. So soon as the yet uncleared portion of the ravine in the vicinity of the hospital is properly cleared, which it will be as soon as possible, nothing further can be desired as regards the building and its immediate sanitary condition. 19. The deficiencies felt in the medical treatment of sepoys may be summed up as follows:— 1. Want of means to ensure due attention to and nursing of the sick. 2. Want of means to regulate and supply proper diet and cooking. 3. Want of trustworthy military surveillance to prevent irregularities, such as indulgence of narcotics, introduction of unwholesome fruits and other articles of food improper for the sick patients, absenting themselves from hospital without leave, &c. 4. Want of sufficient authority on the part of the medical officer to punish trivial offences, and neglect on the part of the hospital attendants, &c. 20. The hospital havildar has orders to see that patients ordered to do so, take exercise for a certain time near the hospital every evening. Other convalescents are permitted to reside in their barracks and move about the lines, but they must not go beyond them. There are no special provisions made here for the purpose of affording exercise for convalescents such as walks, seats, &c., nor are any such required. 21. There are no soldiers' wives at the station. 22. All cases reported sick, about which there is the slightest doubt, remain one day in hospital for observation, and are detailed to inform the apothecary when attacks of fever come on, so that he may see them, and be certain they have it (*vide* rolls transmitted marked "Local"). 23. The medical officer reports officially to the officer commanding as to repairs or other sanitary matters, orders diet on his own responsibility, and medical comforts to the extent sanctioned by the Director-General, Army Medical Department, any departure from which in excess would involve special correspondence with his secretary or the commissariat officer, and, unless sanctioned, the expense charged to the medical officer. Since the 5th October 1858, the extent to which medical officers can supply such comforts to troops on *foreign service* has been liberal and sufficient in every respect. 24. A hospital for convalescents has been erected this year by H.E. the Governor, on my recommendation, made at a time when a very great amount of sickness prevailed; but since its erection such great and unexpected improvement has taken place in the health of

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	the troops as to almost obviate the necessity for its use, but as it is now complete (May 1st), I shall remove a few chronic cases, now in hospital, to it. The building is situated on a point of land jutting out into the sea, where it is almost entirely out of the direction of winds which pass over marshy places, the prevailing winds being off the bay.
XIII. BURIAL OF THE DEAD.	1. The burial ground for British troops is about a quarter of a mile to the eastward of the station, out of the direction of both monsoons and the land and sea breezes. Only four interments have taken place as yet. The old graveyard is close to the sea, at least half a mile from any European habitation, and two and a quarter from the lines. The Chinese still bury in that quarter. 2. The area of the burial ground is about two acres, the soil being a loose silver sand, with just enough vegetable deposit to enable the grass to grow, the subsoil gradually merging into soft sandstone. The drainage is indifferent, the situation being too level, but the ground is fenced in, well cleared of jungle, &c., and well kept. No opportunities have been afforded of judging as to whether decomposition takes place quickly or not. 3. There is no limit as to the space between graves or the depth of graves, but the latter is usually from five to six feet. They are never re-opened, nor can the necessity ever arise for burying two bodies in the same grave. Interments are rarely deferred beyond 24 hours after death; they generally take place within six hours. The native troops are interred by their comrades after their own fashion, usually in the uninhabited jungle within a quarter of a mile of the cantonments. 4. The graveyard is never offensive in any way; on the contrary, it is an advantage, as it is cleared of jungle. 5, 6, 7. The dead of camp followers, &c., are interred by their friends in the same manner as the sepoys. No injury arises to the public health from the present practice, and no improvements are consequently required in the way of regulation or otherwise in the disposal of the dead.

(Signed) W. KINCAID, Lieutenant, 22nd Regiment, N.I.
J. J. FRASER M.B., Assistant-Surgeon.

May 1860.

"STRAITS SETTLEMENTS."—PENANG.

Accommodation
- Queen's Troops
  - Half an European Company, with a few Families.
  - For a Quarter Company, with many Married Men as now.
- Native Troops
  - Artillery - Two-thirds of a Company.
  - Infantry - Seven or Eight Companies.
  - Head Quarters.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The surrounding country is level, with nutmeg plantations enclosed by hedges; a range of hills crosses the plain towards its western extremity north and south. It is sandy, dry, and flat, except towards the range of hills. There is not much wood on the plain except plantations and high hedges, but there is forest wood on the hills three miles from the fort, and one mile from the native infantry cantonment. Good water is everywhere scarce; it is conveyed from the hills to the town, and for the shipping in the port by an iron pipe with reservoirs. But there is a fine stream passing near the native infantry lines, which are supplied by an off-set from it running through them. 2. The elevation of station above the sea is generally but a few feet, and it is on a level with the surrounding country. The native infantry cantonment is about 25 feet above the sea, and a few feet above the canal and nullah. The only higher and healthier ground adjoining the station is the hills which would form an excellent location for Europeans. A good military post could be established on the hill far out of reach of an enemy's ship guns, and if well stored, with occasional communication from the sea, could be held against a superior force in time of an European war (the fort being useless, and only exposing men, treasure, stores, &c., to any enemy from the sea.) There is no much higher ground than this on the plain of the island, with reference to the rest of it, for field work with much command, which latter, however, is what the island requires for effective military defence in case of external attack. 3. There is a little table land on the hill 5 miles from the artillery fort, and 3 miles from the native infantry lines; its height is about 2,500 feet. 4. The sea is contiguous to the artillery fort, and there is a fine stream 200 yards from the native infantry lines. Neither the vicinity of the fort or native infantry lines is liable to overflow of water. To the west of George Town, but far from either of the above places, the level being low, the water percolates in through mangrove banks, and there is flux and reflux. There are no broken grounds or ravines near the station; there are a few wells, but they are not injurious to health. 5. The island would be pleasantly pervaded by the light sea breezes of the latitude, were it not for the plantations and the hedges which obstruct it. But it is now said to be healthier than when there was not so much plantation, probably from the latter retaining the deposit from dew, which makes the climate of the interior very refreshing in the nights and mornings. The temperature of the station is not raised by reflected sunheat, excepting in and about George Town. The station is exposed to the sea breeze only, which is generally light and healthy.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	6. There are several nutmeg plantations, and more inland a great deal of rice is cultivated. There are no works of irrigation. The cultivation of rice is not prohibited within certain limits, but generally it does not approach near. There is no cultivation of indigo, nor is the preparation of hemp or flax carried on near the station. 7. George Town is contiguous to the fort (artillery), but is 3 miles off from the native infantry lines. 8. The geological structure of the district is alluvial, with a sandy surface; the subsoil is loam. The ground on which the native infantry lines are situated was never before occupied. It is now cleared of the sepoy huts, and airy barracks have been built; the site is unencumbered. 9. Water is found during the dry season at the depth of a few feet, and in the rainy season near the surface. 10. The rain fall and surface water does not flow readily away, the country being too level, but water sinks into the subsoil quickly after the cessation of the rains. The ditches retain the stagnant water more or less after rains from the dead level, which is rather objectionable. The municipality, however, attend much to this. No drainage from higher ground passes into the subsoil of the station. 11. The best water for the supply of the station is obtained by means of an iron pipe laid from the hill. There are some wells, but the water is not generally good. There is one fine stream of excellent water. There are no tanks for drinking purposes. There are some bathing tanks formed at the head of the native infantry lines by a duct from a stream near them, which afterwards flows through them in smaller streams, which is used for cooking purposes, and for washing clothes and utensils; but drinking water is mostly obtained from wells in the lines. At present different waters are used for drinking, cooking, and washing purposes. The water tanks and wells are not liable to pollution from any source. Malaria sometimes proceeds from the stagnant open draining ditches after heavy rains, the dead level rendering it difficult to keep them run off. The municipality attend to this better of late. Chinese garden cultivation, with deleterious manures (rotten fish, ordure, &c.), was much worse in the neighbourhood till prosecuted by the present commandant in the Recorder's Court, who also agitated the improvement of hedges and ditches with the municipality. 12. The water supply to the native cantonment is unlimited, and is sufficient for an European regiment down in, or near the fort. The water is excellent, and is colourless, inodorous, and without any marked taste. There are no means of obtaining an exact chemical analysis of it, being chiefly rain water. Softness is its predominant character; its quality is good, and not injurious to health. The supply for the troops is ample. No extraordinary means are required for raising and distributing it; no better supply could be obtained. The main and best supply is by 3 miles of iron pipe from the hill to the wharf, with intermediate reservoirs. 13. With regard to other topographical points, perhaps the interposition of the hills across the island north and south, barring off the westerly breezes may be disadvantageous to the native infantry cantonment, which is under the lee of it. 14. With regard to the inquiry and examination previous to the selection of new stations, the present native infantry station was selected long ago. There is no military sanitary station. The hill is capable of being rendered, at a small expense, one of the best stations in India, for a few European troops, and for sick from Singapore and China, but not for more than two companies with officers and establishments. Provisions could be obtained from below at first, and the streams of water should be reservoired.
II. Climate.	1. The instruments available at the station for conducting and registering meteorological observations are a barometer, thermometer, and pluviometers. The registry of the above is discontinued by order. 2. Table of meteorological observations from 1st January to 31st December 1859:—

Month.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain, Inches.
January - -	29·62	79·8	6·0	82·8	76·8	1·80
February - -	29·65	80·9	6·9	84·4	77·5	2·35
March - - -	29·60	83·7	6·4	84·9	78·5	5·70
April - - -	29·55	82·2	6·4	85·4	79·0	6·60
May - - -	29·60	83·2	6·4	84·4	78·0	10·5
June - - -	29·60	82·5	6·4	85·7	79·3	2·25
July - - -	29·55	83·9	6·1	85·0	78·9	4·35
August - -	29·55	83·0	6·0	84·0	78·0	1·6
September - -	29·60	80·3	7·1	83·8	77·5	11·9
October - -	29·50	78·7	5·6	82·5	75·9	22·6
November - -	29·55	79·8	5·9	82·7	77·0	7·0
December - -	29·60	78·3	7·8	82·2	74·4	5·6

3. It rains so frequently, though not constantly, all the year round (September, October, and November being considered the most rainy months) that there is always dew deposit on the great vegetation of the island, and being no dearth of water keeps the nights and mornings always more or less cool and invigorating; this, with the sea air all round and occasional light breezes, renders the climate a decidedly good one in comparison with India generally; the thermometer generally averaging 5 to 10 degrees less. These good effects are somewhat counteracted by the relaxing nature of the climate, owing to a powerful sun always converting its moisture into steam, and to the remarkable absence of motion in the air so near the equator, particularly in the evening, which makes less real heat than in India more felt. But the climate being favourable to healthy action of the liver admits of its evil effects being counteracted by diet. The native soldiery appear to suffer from its untoning effects to an average per cent. which virtually destroys nearly a whole regiment in dead and invalided in a three years' tour. Sentry duty, and the restraint of military clothing and accoutrements with extra labour, and the irregularity attaching to the preparation

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References to Subjects and Queries.	Replies.
II. Climate—*cont.*	and conveyance of food to their comrades on duty, in the absence of their families, as well as for themselves, combined with the almost entire absence of animal food, family separation, so unhabitual to the natives, nostalgia, and the unfavourable effect of the climate on them as compared with Europeans, and even the Indian coolies and convicts, are no doubt the probable causes of this destruction, and apparently can only be effectively dealt with by abandonment of Penang by the native troops. The tree-planting now subsisting affects the climate favourably by retaining dew; formerly there was much jungle, the malaria from which, owing to decomposing vegetation, without free passage of air, as in most Indian jungle tracts, made Penang fever somewhat proverbial. At present fever is almost unknown. There is no impurity from dust, but there is some locally here and there from rotten fish, ordure, urine, &c., in Chinese cultivation, which is, however too limited to affect the climate out of the town, or to be more than an occasional local offence. Shelter from the rain is desirable at all times, though the effects of wettings are not violent here. The great precaution never to be disregarded, is to sleep on a cot or raised flooring or boards, but never on the soil, the damp from which causing fevers, diarrhœa, rheumatism, &c. It may here be mentioned, as making this a somewhat distinguishing peculiarity of this soil and climate, that ponies of the hardiest kind, if not walked about to cool gradually, after heating work, are sure to catch violent fever and inflammatory complaints which destroy them. The men should, while lightly clothed, have the skin so protected as to guard against sudden cooling—thin flannel probably—the wearing of which by Europeans and not by natives possibly causes some part of the difference of the effect of the climate upon them. Beyond this it does not seem to call for any particular precaution as to amount, nature, and times of drill, duties, and exercises, which should never last too long at one time, nor be very violent. The early mornings are cool and refreshing; early rising and exercise should be insisted on. No part of the year is especially unhealthy. There are no prevailing diseases here except small-pox, which may be considered endemic. 4. There is no district near the station, the climate of which is more conducive to health except the hill before referred to. Possibly a location for natives might be adopted on the west side of the island, and where the hill would not keep so much of the sea breeze off as it does where they now are. But want of animal food and other causes, independent of local climate, chiefly affect their health more than the present site, which is good. 5. The commanding officer has served in all the eastern and western coasts, Madras Presidency, Mysore, Deccan, Tenasserim, and Goomsore. I consider the western coast positively injurious to Europeans, and Goomsore of course much more so, and to natives also. The others are highly favourable, the eastern coast being the least so to Europeans. The climate of Penang reminds me very much of the western coast, more particularly of Travancore, but it is healthier in the long run. The following are the stations at which Captain Mitchell has served, Palaveram, Masulipatam, Berhampore, and Russelcondah, in the northern division; Nagode, Dumoh, and Mhow, and Secunderabad, Deccan, and Penang; they are all healthy. The medical officer has served at St. Thomas's Mount, Madras, Jaulnah, Nagpore, Bellary, Hyderabad (Sinde), Soukara, Concan, Kolapore, Trichinopoly, Cochin, Bangalore, Rangoon, Bassein, Hyderadad (Deccan), and Penang; all are healthy, with the exception of Hyderabad (Sinde), when I was stationed there, but which I believe has since been healthy.
III. SANITARY CONDITION OF STATION.	1, 2, 3. A map of the station and adjacent country, and a plan of the station and barracks, are transmitted. There are no water tanks, nullahs, or canals in the station. The ditches are all open, and when stopped up are cleared by the municipal commissioners. There is no military cantonment, properly so speaking, the whole island being for the municipal purposes generally under the Commissioners. The Chinese cultivation is the only nuisance. Pucka privies for the infantry are about to be constructed. 4. Table of barrack accommodation. Date of construction; European barracks, 1817; Native Infantry barracks, 1860. Total number of rooms or huts, European barracks, 16 rooms. Total regulation number of non-commissioned officers and men. Europeans, 1 company; Native Infantry, 600 men; Gulaudauze, 1 company.

Barrack Rooms or Huts.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Heighth of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
								Ft. In.		Ft. In.	Ft.
European Artillery, 16 rooms	1 Married 4 Single	13	20	12	3,120	195	65	2 6	2	4 0	3
Native Artillery, 1 room	100	95	26	9	2,470	$222\frac{3}{10}$	$24\frac{7}{10}$	2 6	4	4 6	3
Native Infantry Barracks, 4 rooms	150	222	48	20	213,120	$1,420\frac{12}{15}$	71	2 6	40	6 0	4
Guard Room	1	15	20	9	2,700	—	—	2 0	4	6 0	3
Prison Cells :—											
Native Artillery	2	12	10	8	960	—	—	2 6	—	—	—
European Artillery	2	11	10	16	1,760	—	—	1 6	3	2 6	6
Native Infantry	1	12	20	12	2,880	—	—	1 6	4	2 6	6

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides and open outwards; there is a verandah 6 feet broad all round each barrack, but they are never used as sleeping quarters by soldiers or others; there are neither jalousies nor jhilmils, but the windows open with bars and shutters. 6. The bedsteads in use are wooden, with the bedding as per regulations; they are periodically washed; iron would be better, as it is less likely to harbour vermin. No other alterations to suggest. 7. Tents are seldom used in Penang; they are, however, according to regulation; they are unhealthy from the peculiarity of the soil, which renders some interposition, such as flooring, &c. necessary, as before stated. 8. There are no artificial means of ventilation beyond doors, windows, and ridge ventilators. The ventilation of the native infantry hospital was very defective, and had, no doubt, greatly aggravated bad cases here from originally slight ones. Through the interposition of the commanding officer it has been remodelled. The ventilation is generally sufficient, except at the above hospital, where punkahs are kept working at close periods. That of the European and golundauze barracks is quite sufficient. No tatties or punkahs are used in the barracks or European hospital, the generally cool day, sea breezes, and night air dispensing with them. 9. The barracks are built of brick; those for the Europeans are tiled, and those for the native infantry leafed. The tents are of the usual description; no huts are used now. 10. The European artillery barracks are over the gun-sheds, and the floor is constructed of boards; there is a free passage of air below. The golundauze barrack floor is of chunam, but is not raised above the ground. A defect in the flooring of the native infantry barracks is in its not being under-arched, and as it is, the substratum is not even firm, but sinks, ill admitting of washing; this can easily be remedied. 11. The materials are suitable for the climate; but I think all floors here should be raised on archworks so as to admit a passage of air below, the contact of men or animals with the ground below producing fever and other diseases, so much so that no common pony is allowed to stand but on boarded floors. The barracks and cantonments are kept in repair by the executive engineer; the repairs are performed by convicts and executed as speedily as possible. The municipal board is as yet responsible for the general sanitary state; but when the cantonment just marked out is formed it will come under the Quartermaster-General's regulations in this respect. The floors of the new native infantry barracks are washed every Saturday. Lime-washing has not yet been applied, but is about to be so, entry being scarce complete yet. In the European barracks it has since been applied; they are cleansed and whitewashed annually. 12. Baths have been formed for the native infantry, through which the water continually flows; there are also ditches full of running water in all directions. The Europeans have tubs in a washhouse supplied with water in a well in the same. The golundauze wash from a well. 13. Both European and native soldiers are supplied with cooking places of the ordinary description, in long rows. Dhobies wash for Europeans, and they themselves wash some of their linen in their tubs and dry them on the fort walls. For natives near the native infantry lines there are the usual "Dhoby pett," or washerman's quarters, situated on a large stream, and are quite healthy and open. The washing for the European troops is done in the fort. 14. The privy outside the fort is over the sea, and those inside the fort discharge themselves into a cesspool, which is emptied periodically. 15. These buildings are ventilated by windows. All barracks are lighted by globe lamps, with oil and wick. 16. One long drain with connecting pipes at intervals through the walls carries the drainage of the barracks into the fort ditch, the distance between the barracks and outlet for the drainage being about 30 feet. There are no sewers or drains to the native infantry barracks, they being scarcely wanted. The drainage is sufficient for conveying away all surface water from the men's lavatories, baths, &c. No part of the barracks or hospital is damp. With regard to foul ditches, *see* qy. 10, Topography. 17. Surface cleansing is carried on by the municipal commissioners at present, there being no regular cantonments; it is very inefficiently done. 18. Cantonment is not yet formed; but one has lately been marked out three miles from the fort, where the native infantry are. The future cantonment is in its centre, and where the regiment is, free from over vegetation, and is the airiest and coolest spot in that part of Penang. The boundaries will, however, be a belt of hedges and gardens with trees, which can hardly be removed, though, when the cantonment is formed, these objections can be brought as far as necessary under the Quartermaster-General's regulations. 19. The native infantry bazaar is very small, and under regimental surveillance. It is well drained and ventilated, with a plentiful water supply, &c. There is no regular regimental bazaar here, the Europeans and golundauze having none. The native houses, mostly Chinese, near the station are filthy, being literally dung-heaps and cesspits themselves; all filth is thrown under them, and there are abominable gutters in front. The stenches in the neighbourhood of the native infantry lines and officers' houses are sometimes very bad indeed, owing to the large amount of Chinese cultivation; it has been much mitigated, however, through the efforts of the present commandant. The nuisance could be prevented by forcing every householder to keep all the ground beneath and around his house clean, and by prosecuting every Chinaman for committing a public nuisance, or who makes use of human ordure, urine, or rotten fish for manure, and also by forcing them away from the vicinity of the habitations of civilized people. This would, however, discourage the desired populating of the island chiefly by Chinese. 20. The contractors' slaughter-house is full 1½ mile away from the troops. 21, 22. No bazaar or cavalry horses at the station. 23. There is separate accommodation for married non-commissioned officers and men, which is good and sufficient. Married people do not occupy barrack rooms with the men.

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.* *Officers' Quarters.*	1. There are only two officers' quarters in the fort; they are on the ramparts, and are high, airy, and excellent. There are no officers' quarters, properly so called, in the native infantry lines; the officers occupy up-stairs bungalows belonging to the residents of the place, and similar to those occupied by them. Their sanitary condition is satisfactory on the whole, but the ventilation is somewhat interfered with by the plantations of nutmeg or cocoa-nut trees, which closely surround most of them. This could be improved by clearing away the trees, but these, as well as the houses themselves, are private property.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining native population are healthy. 2. The most prevalent diseases among the native population are small-pox, with outbreaks of epidemic cholera; there have been no cases of spleen disease. 3. There are no circumstances very obviously adverse to the health of the native population. 4. The few European artillery here have been received at broken periods from Madras, Masulipatam, and Singapore. Since their arrival they have chiefly suffered from fevers, diarrhœa, and bronchitis. The detachment native artillery were at Sumbulpore from February 1857 to December 1858; while at that station they chiefly suffered from fevers and rheumatism. They arrived here in April 1859, in good health, and have since chiefly suffered from diarrhœa, dysentery, and dyspepsia. The native infantry were at Secunderabad from 18th February 1857 to 1st December 1857, where they chiefly suffered from fever, diarrhœa, and rheumatism. They arrived here on the 18th, 29th, and 31st January 1858, in good health, and have since chiefly suffered from ulcers, fever, diarrhœa, and rheumatism. Hitherto no one portion of the men's accommodation has appeared more unhealthy than the rest. The native regiment is now moving into new barracks. 5. The European artillery and golundauze are camped out during March and April, yearly, at practice, without any prejudicial effect to their health, but probably with more or less benefit. 6. The commanding officer commanded in the Neilgherries for two years, during great part of which European troops were stationed there. Unless carefully attended to as to exposure, checks after exercise and clothing, the effect was for some time so far prejudicial as greatly to produce diarrhœa and fevers. I cannot speak to the effects of more than a year; but I should say, that while there can be no doubt the same restorative effects must result to European soldiery as to the upper classes, *ceteris paribus*, the great obstacle to hill stations benefiting bodies of European troops is the impracticability of maintaining them altogether under the same cautious observances as individual officers, from their being all in one barrack, for one reason, where a temperature or exposure suiting some may not suit others, and from their being all at more or less liberty to indulge their own inclinations elsewhere, in the way of exercise and exposure, &c., where medical officers have a great difficulty in always restraining gentlemen residents for health from exposing themselves to the injurious effects of the climate. 7. Cannot say whether troops long resident on hill stations are more or less liable to attacks of febrile or other diseases on returning to service on the plain. 8. The commanding officer does not approve of selecting hill stations for troops, except for sick depôts (convalescent), from his experience of troops stationed in the Neilgherries. It does not acclimatize the higher grades, though it greatly favours convalescence in both. 9, 10, 11. No experience of hill stations; but the shortest period of residence which would enable troops to obtain the full benefit of such residence, would be probably not less than twelve months. 12, 13, 14. No experience of hill stations. It would probably be most conducive to the health of troops serving in India to locate them on hill stations, with short periods of service on the plains. Frequent change of station on the plains is beneficial. 15, 16, 17. No experience of hill stations. 18. No particular class of surface and subsoil either more or less healthy than others. 19. A soldier proceeding to India should not be under 20 years of age. The best period of the year for troops to land in India perhaps varies in different Presidencies; but in Madras the best time is November. European troops are never first landed from home at Penang; but recruits landing in India should be kept from exposure and intoxication. 20. Troops should be sent direct from home to India, and land with as large a stock of health as possible. They should avoid exposure and intemperance. 21. No transport from the port to the interior is required here. 22. The number of years a British soldier should serve in India is from 7 to 10 years, if in the plains. 23. It is not desirable to avoid an amicable difference of opinion in the manner of conducting medical boards, as regards individuals brought forward for invaliding. 24. Invalids should leave India for home, so as to land in England late in the spring.
Diseases.	1. There are regular inspection parades there once a week for the discovery of incipient diseases at this station. 2. There has been no scorbutus among the troops at this station. 3. Hepatic disease is rare among the natives. There has been none at this station. The few Europeans stationed here have, on the whole, been free from it. 4. No case of dracunculus has been contracted at this station. 5. The proportion which venereal disease bears to the total sick in the European artillery is 2·912 per cent.; in the native artillery it is 5·434 per cent.; and in the native infantry it is 2·253 per cent. Lock hospitals would be advantageous. 6. The diseases which the troops suffer are chiefly endemic. Fever, chiefly daily intermittent type. Dysentery, in both the acute and chronic form. Cholera. No case has occurred since the arrival of the troops.

References to Subjects and Queries.	Replies.

IV. Health of the Troops —*Diseases—cont.*

Small-pox always prevails in the island more or less. The troops have been free from it.

Rheumatism, chiefly chronic.

The proportion which admissions and deaths from these diseases bears to the total admissions and deaths is given in the following table:—

Admissions.

Diseases.	European Artillery, per Cent.	Golundauze, per Cent.	Native Infantry, per Cent.
Fevers	5·825	11·956	18·367
Dysentery	0·970	7·728	4·709
Cholera	—	—	0·068
Small-pox	—	—	—
Rheumatism	10·679	10·870	7·986

Proportion of Deaths to Admissions.

Fever	—	4·543	3·345
Dysentery	—	—	8·550
Cholera	—	—	100·000
Small-pox	—	—	—
Rheumatism	—	—	0·854

The above includes only the last 29 months, no records beyond that period being available.

7. The nosological character of the zymotic diseases is for the most part adynamic. These diseases do not seem to prevail in excess at any particular season. The native dwellings are deficient in cleanliness, there being no organized system of drainage; but the country is intersected by ditches through which the constant heavy rains carry all refuse matter into the sea. The water supply is defective: the ventilation is open. The native troops are addicted to the use of narcotic drugs, and also dispose of their rations. They appear to suffer from nostalgia. There is no particular predisposition to disease among the native population.

8. Epidemic disease is intensified by fatigue, intemperance, and exposure on the part of the soldier.

9. Small doses of quinine have not been tried at this station as a prophylactic against malarial disease.

10. The station is not liable to epidemic disease, as far as can be ascertained.

V. Intemperance.

1, 2. The soldiers at the station are rather intemperate. Drunkenness can scarcely be said to exist among native soldiers. The Europeans are too few at this station to afford any reliable data as to the proportion of confirmed drunkards. Drunkenness is always punished as an offence.

3. Distilled spirits are not sold in the canteen here; they are obtained from the commissariat on payment; they can be had in the bazaar, although prohibited. The quantity allowed per man is two drams of arrack, at 1 anna per dram; the quality is good. Spirit is not, under any circumstances, a part of the rations for soldiers, but they are allowed two drams a day on payment. No dram is taken before morning parade. It is never given as a ration to convalescents, but is sometimes allowed by medical officers on payment. There is no canteen. No deleterious drinks, other than intoxicating drinks, are sold in the bazaar.

4. The consumption of spirits is injurious to men in health, but it is of service in certain cases to convalescents. It is scarcely conducive to efficiency and internal discipline, but only positively otherwise when taken immoderately.

5. It would be beneficial to abolish or restrict the sale of spirits in the canteen and bazaars.

6. Malt liquors or wines would be less injurious to health than spirits.

7. The men are in the habit of using lemonade, coffee and tea. Soda water is expensive and beyond their means. Their influence on health, efficiency, and discipline is beneficial, and they are preferable to spirits and malt liquors.

8, 9, 10. It would be beneficial to suppress altogether the spirit ration for men in health, and to substitute for it beer, tea, or coffee, &c. Spirits carefully administered in some cases of disease are at times of service.

11. There is no canteen. Spirits, &c. are sold in the bazaar, under the Excise Act, for the settlement of Prince of Wales's Island, Singapore, and Malacca, No. 14, of 1851, stated to be strictly enforced.

"XXX. Every spirit farmer, and also every keeper of a registered taking-house or spirit shop, who shall knowingly sell or deliver to any European or native soldier any spirituous liquor or arrack, without having an authority in writing so to do from the commanding officer of such soldier, shall for every such offence forfeit a penalty not exceeding 50 dollars.

"XLI. Every toddy farmer, and every keeper of a registered toddy shop, who shall knowingly sell or deliver any toddy or bhang to any European or native soldier, without having an authority in writing from the commanding officer of such soldier, shall forfeit a penalty not exceeding 50 dollars."

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References to Subjects and Queries.	REPLIES.
VI. DIET.	4. The ration for British troops and European troops in the Indian army is the same, and consists of 1 lb. bread, 1 lb. meat, 4 oz. rice, 2½ oz. sugar, ⅝ oz. tea, 1 oz. salt, 1 lb. vegetables, 3 lb. firewood. No changes are made at this station. The rations are inspected by the officer commanding the artillery detachment at this station.
	2, 3. A complete ration, including vegetables, but no fruit, is provided for the troops, the stoppage for which is 3 annas 4 pice per diem. The soldier takes three meals, breakfast at 8 a.m., dinner at 1 p.m., tea or supper at 5 p.m. The proportion of vegetables entering into the constitution of the ration is 1 lb. No improvement suggested. Europeans do not dispose of their rations, no one being allowed to take any portion of them out of barracks. The sale of rations by native troops is a serious evil. I have officially represented it as calling for legislative prohibition.
	4. Cook-houses are attached to the barracks, and utensils are supplied by Government; the cooks are paid by the men. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. The food is roasted, boiled, fried, curried, or stewed at the men's option. The cooking is properly done and sufficiently varied. No refreshment is provided before a march, but half-way the men have coffee.
	5. Gardens for the cultivation of vegetables could not be established at Penang, there being no ground fit for that purpose.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The dress and accoutrements for native and European soldiers at the station are as yet those generally in use in the British army; they are certainly not suitable to the climate; nothing could be less so. The dress on the plains in hot weather should be loose, of light material, dark coloured, with a light helmet covered, a cloak for night duty. On the hills a similar dress, of warmer materials, should be worn, also body flannel. The soldier's neck (European and native) is now freed from the deadly stock and Prussian collar. The sepoy wants, more than anything, a rational head-dress, such as his own cloth turban, neatly and uniformly worn, with some cover and regimental number, or else the Kilmarnock bonnet. The present thing is worse than the knapsack was to him. On guard the men have verandahs, sheds, and sentry boxes to protect them from the sun and wet.
Duties.	1. No advantage would accrue from drilling the men at home before being sent to India. The occupation and exercise of learning duties is good for the young soldier at first in India, keeping him from vast evils. From my 40 years' observations of European soldiers in India I cannot concur in the theory that the advantages of their having learnt all their duties at home would be such as to countervail the above vital considerations. Unemployment is the European soldier's bane in India, especially the "griffin" soldiers, and being kept out of harm's way at first, with ample morning and evening open air exercise, must be better for these latter than being at once only sent on sentry duty, to be idle and comparatively without morning and evening exercise in the open air at other times.
	2. There are so few troops at this station that there is very little drill. The earlier the hours for drill, parades, and marches the better. On a march, if a soldier sleeps from 7 p.m. till 12 or 1, he can then gently perform any proper march before the sun is up; this is the plan I adopt. The average number of nights the men have in bed during the week is seldom more than 3; latterly it has been less. The troops here are too few for the sentry work.
	3. The European guards are mounted at no distance from the barracks; but the natives so far off as to distress them. Guards last 24 hours. I tried to get the native infantry regiment placed nearer to town. The roll calls are at 5 a.m., and 8 p.m. for Europeans, that at 5 p.m. was instituted by my order to keep the men from going about the bazaars from 3 to 6. The roll calls for natives are 2 p.m., 8 and 9 p.m., and 5 a.m. Without their families, the check is required upon their further wearing themselves out here by undue resort to the town, &c. The effect on the health of night guards is no doubt prejudicial, being unnatural, and tells even more on natives than on Europeans. But the duty is unavoidable, and I do not think more precautions could be taken. Two hours is a long tour, but one hour would tell worse on the whole guard.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation at the station:—There is a good skittle alley in the fort, and also a good library for Europeans There are no ball courts, schools, soldiers' clubs, day rooms, soldiers' garden, workshops, theatre, or gymnasia. There are too few Europeans for sustaining more means for these purposes than the above, and the native infantry and golundauze have too much to do to require any other. Europeans are restrained from exposure to sun and rain out of barracks when off duty, no doubt with negatively the best results to health.
	2. Were there many Europeans here, workshops and boating should be provided. Gymnastics are too heating, followed by insufficient precaution. Gardening is good, but partial. Mental and handicraft employments would be best for Europeans in India.
	3. Soldiers' savings' banks are advantageous, and work some good here.
	4. There is sufficient shade from trees and other means for Europeans, but not for natives. The Bengal "bells of arms" here are wretched, compared with the Madras places of arms. I have moved for the latter.
IX. MILITARY PRISONS.	1. The solitary cells and prisoners' rooms are roomy and sufficiently ventilated; they are too little numerically used to need suggestion.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the general presidency regulations.
	2. The medical officer has no direct power as regards the conduct of the line of march, troops, &c.
	3. The most eligible available ground, as far as circumstances will permit, is selected for camping, agreeable to the general regulations. It is kept free from all matter of a nature injurious to health. When troops are halted in the same locality for any length of time, the camp, if practicable, is shifted every 3 or 4 days. The tents are open and well ventilated; water is supplied by bheesties both to the tents and hospital. The

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	medical officer can only suggest or recommend; he has no power beyond, decision being vested in the commanding officer. There should be a sanitary officer attached to every force in the field, with full power in these matters. 4. I am not aware of the existence of any regulations regarding field hospitals; there used to be a heavy ambulance, quite unfit for field service, attached to regiments on the march. It is reported that a preferable one is about to be substituted. The sick are carried in doolies; the hospital supplies in a field medicine chest and in portable medicine boxes. Other boxes are at times used, when conveyed on carts. All carriages supplied by the commissariat.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1, 2. The European hospital is built over gun-sheds. It is open to the sea face, but has the noisy golundauze barracks immediately in the rear, and has the full benefit of the noise and nauseous odours peculiar to natives and their cooking. The native town also is immediately in rear, and the houses of the civil population are all round in close proximity. There are no stables, and the barracks are in the fort, distant about 200 yards. The golundauze hospital is over the same range of gun-sheds, and I consider the situation extremely bad, even for natives, but much more so for Europeans. The sites of both artillery and native infantry hospitals are, I consider, most excellent, being both open and freely ventilated. There are some nutmeg trees near the golundauze hospital; but they do not interfere with ventilation. The sites are healthy with respect to elevation, drainage, &c. 3. The water supply is abundant and wholesome. 4. The drainage is carried outside the golundauze hospital wall by means of open side and cross drains, and eventually into the sea. 5. The wards of the native infantry hospital are on a basement 2½ feet high, which is filled in, and no current of air passes beneath. The golundauze hospital is on the ground-floor. The European artillery hospital is an upper story. The roof water sinks into the subsoil. The surface drainage and gutterage is quite sufficient to carry away the rain-fall rapidly. The native infantry hospital is constructed of bricks and mortar, and tiled roof with ridge ventilators and windows above. There is a verandah on three sides 10 feet wide, but they are never used for the accommodation of sick, convalescents, or others. The hospital consists of one flat. Table of Hospital Accommodation. The date of the construction of the native artillery and European hospital is not known. The native infantry hospital was erected in 1860. Total number of wards, 5. Total regulation number of beds, 46.

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Fee per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.				Ft. In.		Ft. In.	Ft. In.
Native Infantry Hospital, 3	14	80	18	19	49,590	1,771	93	2 6	27	2 6	5 0
	7	39	15	19					12	7 0	5 0
	7	39	15	18							ventrs.
European Artillery, 1	10	38	19	10	7,220	722	72⅕	2 6	5	5 0	3 6
Golundauze, 1	8	27	18	10	4,860	607½	27	2 6	4	5 0	3 6

The artillery hospital is only open on the N.E. side; on the N.W. the wards are, both European and native, attached to gun-sheds, and on the S.W. only a narrow yard and high wall interpose between it and the native artillery barracks. The site of the native regiment hospital is open and detached; it is situated 150 yards to the N.W. of the barracks, and like them is shut out by the range of hills from the sea breeze. They are provided with Venetian windows with hinges, which open outwards.

6. In the European artillery male ward there are windows on all sides. The female ward is indifferently ventilated, the windows on two sides being five feet from the ground, and on the other two sides there are no windows, but four doors, two opening into adjacent rooms which are occasionally used as convalescent wards, one opening into the bath-room, and the fourth on the landing-place at the head of the stairs. The native artillery ward is on the ground floor; it has a single window on the S.E. side, looking into the street, and two on the S.W. opening on the yard. In the native infantry hospital there are 16 doors, 22 windows, and 27 ventilating windows above.
7. There is no apparatus for cooling or warming the wards, none being required. The whitewashing of the wards is performed annually unless required oftener.
9. The hospital has a privy of ordinary construction over a cesspool; it is not offensive.
10. With regard to lavatories in the hospital, it is a matter for the medical officer's arrangement, there being no particular conveniences for this purpose.
11. The European artillery have a bathing room attached to both the male and female wards, which are supplied with water by the bheesties. The supply is sufficient, and the arrangements convenient. The natives are supplied in the same way, but have no bathing rooms.
12. In the European artillery and native hospitals, all foul linen is removed by the washermen, and returned when washed and dried; the means are amply sufficient.
13. The storage is sufficient and dry.

PENANG. MADRAS.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	14. The hospital cots are of wood. The bedding is supplied by the commissariat, and consists of two quilts, one blanket, and two pillows. The cots should be iron; the bedding is good. 15. The kitchen is merely an open shed. It joins the native ward at right angles, and is immediately below, not under, that of the Europeans. Cooking utensils are supplied by the cook himself. The cooking is tolerable; there have been no complaints with regard to it; nothing but beef and poultry are available. 16. Diet tables according to regulation. 17. At this station there is no hospital serjeant, and no nurse, attached to the European artillery hospital; the men, when requisite, have a comrade to attend on them. To the native hospital there is an hospital havildar, who is relieved once a month, and the men have a comrade to attend on them when necessary. There are also two standing orderlies always in attendance. There should be a nurse at least for the European artillery female and children's ward. 18. The artillery hospital is badly situated, and indifferently ventilated; it is, however, undergoing alterations to some extent. No epidemic disease, hospital gangrene, or pyæmia have appeared in the wards for at least the last two years; there are no available records at the station for any period anterior to that time. No native infantry hospital at present exists, but one is building. 19. The artillery hospital was it appears condemned long ago; it has now, however, been determined to repair, and in some measure enlarge it. Such being the case it only remains to recommend an improved system of ventilation. 20. There is no provision whatever made for convalescents taking exercise; nor any fenced ground, shady walks, or seats, for their use. 21. The female ward of the artillery hospital is indifferently ventilated. 22. There are no special local hospital regulations. 23. With reference to the powers of the medical officer, change of diet and the issue of medical comforts are at his discretion, subject to the approval of the superintending surgeon,—or in the Straits of the director-general. With regard to the sanitary state of an hospital, &c., the medical officer can only suggest improvements. 24. There are no convalescent wards; but such accommodation would be an advantage.
XIII. BURIAL OF THE DEAD.	1, 2, 3. The burial ground is too far from the military station for any ill effects to be felt. The present ground is condemned by a municipal board, and another is under adoption. There is no cantonment or military burial ground at Penang. Native soldiers are burned or buried in various places at a distance. I have had to call for police check upon burning civil dead sometimes too near the native infantry. There are no particular burial rules here, there being no cantonments yet formed. 4 to 7. The general burial ground, has, I believe, been municipally pronounced overcrowded, and is offensive sometimes. Another yard is in course of adoption.

(Signed) DAV. BABINGTON, Colonel, Commanding Troops, Penang.
W. S. MITCHELL, Captain,
Officiating Executive Engineer, Penang.
W. H. S. BURN, Surgeon,
22nd Regiment Madras Native Infantry.

31st August 1860.

(The answers, according to the subjects, are initialed by the commanding officer, the medical officer, and the executive engineer.)

SINGAPORE.

Accommodation { European Troops - Artillery - 1 weak Company.
Native Troops - { Artillery - 1 weak Company.
Infantry - 1 Regiment Madras Native Infantry, minus a Detachment of 105 at Labuan.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is undulating and the vegetation profuse. It consists of low hills rising from a plain; in some parts it is sandy, but mostly consisting of a dark tenacious clay mixed here and there with vegetable mould, and penetrated in many places by salt tidal swamps. There is a good deal of planting, but the primeval forest is distant about 1½ or 2 miles; there is plenty of water. 2. The elevation of the station above the sea is about 25 to 35 feet, and the adjacent country is not so high as the cantonment, with the exception of the hills. There are two nullahs within a short distance of the place, and there are several perennial streamlets and many wells, mostly of rude construction. The neighbouring hills rise from 100 to 200 feet above the station, probably higher. Bukel Timer, five or six miles off, is about 530 feet. 3. Several of the hills in Johon on the coast nearest to the north side of Singapore, rise to a height of about 1,200 feet. 4. The open sea is more than a mile from the station, but tidal swamps or inlets of the sea extend to the station. The nullahs before alluded to are in the station. The neighbouring

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	low ground is much overflowed at every spring tide. There is little or no broken ground except the tidal swamps, which do not appear to have any prejudicial effect upon health. 5. The station is open and freely exposed to winds; gardens abound and hedges are in many places much too high near the station to admit of free ventilation. Military limits are, however, not yet defined. The temperature of the station is not raised by reflected sun heat. A gentle breeze almost daily moderates the heat; the land or jungle wind is the coldest; the sea breeze being sensibly warmer, and often produces lassitude and sometimes fever. 6. The surrounding country is chiefly planted with spice and fruit trees. Catechu is also extensively cultivated, under the name of gambur. There are no works of irrigation near the station, and no rice is grown on the island. Indigo is not cultivated except in minute quantities, nor are flax or hemp in the island of Singapore. 7. The town of Singapore, with a large mixed population, adjoins the east side of the station. 8. The geological structure of the hills consists mostly of a firm clay soil, containing masses of laterite or ironstone, mixed in some parts with silicious sand. Few of these hills rise above 120 feet. The plains are of a uniform level, covered, for the most part, with a superficial vegetable mould more or less friable, under which there is a dark blue plastic clay, containing numerous remains of shells, all of existing species, also corals. Various cuttings have been made from 20 to 30 feet deep, and in all the subsoil is of the same description. The site of the present station was never previously occupied by natives or others. 9. Water is found near the base of any of the hills, and is readily procured good at the depth of a few feet at any season of the year. 10. For the most part rain water flows readily away, though doubtless the very frequent and heavy rains tend to keep up the supply of water as already described. There is no drainage from higher ground which passes into the subsoil of the station. 11. The water supply is derived from wells and natural streamlets. It is not at present stored in open tanks. Tanks for bathing purposes are much required for the use of the troops, and have often been applied for. One is to be constructed, but two or three are necessary. Sources of impurity are pretty well guarded against here, but all wells used for drinking ought to have a wall round them, which at present many have not. 12. As there is more than one perennial streamlet the supply of water available may be increased indefinitely; the water is generally clear and good, but after heavy rains is tinged with clay. It is soft, good, and abundant, but has not been tested chemically or microscopically. It is raised by buckets and carried by men in leather skins; good pumps are most desirable, and would save much labour. Tanks for bathing purposes are much required and could be easily constructed. 13. From the temperature being so uniform throughout the year Europeans are remarkably exempt from the sudden and severe attacks of disease common in Hindoostan, but owing to the absence of a cold season the climate is not well adapted to men who are much reduced in health and strength. 14. Her Majesty's Government having recently determined that permanent barracks for a European regiment of full strength should be erected, considerable discussion arose as to the most eligible site procurable. Finally the selection became limited to the Balestiers property in an open cleared champaign country, on which sugar-cane had been growing for some years about two miles north-east of the town, and to a range of higher ground with a plateau of from 60 to 80 feet elevation in the Tanglin district about three miles north of the station. Ultimately the preference having been given to the latter locality, all the rules prescribed in the Bengal Code of Public Works, p. 166, were adhered to, and a favourable report was obtained from the committee. In this particular case, where there were many European residents and others from whom the valuable ground had to be purchased, there was no occasion for particular inquiries as to disease and sanitary condition.
II. Climate.	1. At present the only instruments available at the station for conducting meteorological observations are, thermometers, aneroid barometers, and rain gauge. 2. The following are the only observations registered for the year 1859:—

Months.	Mean Temperature.	Rain, inches.	Months.	Mean Temperature.	Rain, inches.
January - -	80	15·14	July - - -	82½	7·5
February - -	80¼	9·5	August - -	81¼	13·15
March - - -	82	7·6	September - -	82	5·13
April - - -	81	3·17	October - -	81¼	9·19
May - - -	82¼	3·18	November - -	80	8·10
June - - -	82¼	6·10	December - -	81	7·6

Satisfactory information as to the climate can be gained from Capt. Elliott's able magnetic survey of the Eastern Archipelago, no available means being here at present.

3. The climate is healthy. It is moist, moderately hot, not variable, and is damp from the constant rain and proximity to the sea. Vegetation is rapid; there is little or no irrigation; dust is seldom troublesome, and the only nuisance known to affect the air prejudically is the manufacture of sago, and in the country, the burning of the manure used by Chinese cultivators. The sago nuisance is being gradually got rid of. Provisions of all kinds are very dear, and the Europeans and natives suffer, doubtless, not from the climate, but bad living. The duties are too hard upon the native troops, and they suffer from being exposed to the dews during the nights, being every third day on duty. It has been already observed that there is very little variation in the weather,

SINGAPORE. STRAITS SETTLEMENTS.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	but occasionally there is rather more continuous rain towards the end and the beginning of the year. When such is the case parties suffer from intermittent fever. 4. Probably the site selected by the committee for the location of the European regiments at Tanglin, distant about three miles from the station, which is situated on higher ground, will be more conducive to health. This is, however, only a supposition, as barracks are only *now* being erected there. 5. The following are the stations on which the different members of the committee have served, placed in the order of their salubrity. Col. Burn has served in Neilgherries, Belgaum, Dharwar, Bangalore, Singapore, Kulladgee, Cuttack, Vellore, Madras, Bellary, Kolapore, French Rocks, Vizianagrum, Masulipatam, Nagpore, China, Chittledroog, Goomsore, Manantoddy. Col. Faber has served in Mhow, Singapore, Penang, Jaulnah, Saugor, Madras, Secunderabad, Negapatam, Tanjore, Trichinopoly, Kamptee, Madura, Manantoddy. Dr. Rose has served in Penang, Singapore, Cawnpore, Jhansi, Dumdum, Chinsurah. Dr. Traill has served in Malacca, Singapore, Vizigapatam, Madras, Labuan, Cuttack, Russelcondah, Hong Kong.
III. SANITARY CONDITION OF STATION.	1. A map of the station is not obtainable at present. 2 and 3. Plans. 4. The following Table shows the barrack accommodation. Date of construction, for Europeans, 1844; for natives, 1859. Total number of rooms, for Europeans, 1; for natives in the four barracks, 4, with end rooms for native non-commissioned officers. Total number of non-commissioned officers and men, Europeans, 60; native, 160 in each hut.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		ft. in.	ft. in.	ft. in.				Feet.		ft. in.	ft. in.
Temporary European Artillery Barrack, 1 -	60	97 6	58	24	135,720	2,262	87	2	14	13 6 8 6 11 4	6 4 5 6 7 4
Guard Room, 1 - -	13	24	21	20	10,080	775	39	2	4	10 3	4 10
Prison Cells - - -	1	6	13 8	10 9	780	780	130	2	—	—	—
Native Barracks, 4 - -	160	220	54	16	176,000	1,100	74	2	44	5 9	3 5

5. The windows are on opposite sides, and open outwards. There is no verandah.
6. The cots are wooden ones, and ought to be of iron for the native troops. The Europeans have iron cots.
7. No tents are in use at Singapore, the climate being too damp.
8. The ventilation of the barracks is good. There are also punkahs for the Europeans. The ventilation is quite sufficient in every public building in the station. Punkahs are pulled during the hot weather. The cost of each is about 10 or 14 dollars.
9. The barracks have brick and chunam walls, with tiled roof, for Europeans, and for natives attap roofs.
10. The floors are of tiles, raised about 2 feet. There is no passage for air below.
11. The materials and construction are very suitable to the climate. New barracks are being built for the Europeans; for the natives no improvement is required. The barracks are kept in repair by the engineer department, and the walls and ceilings are cleansed and limewashed once in six months.
12. The only lavatories at present are a few unfinished wells, which are supplied with water by the rains, and may be springs. There should be one good well per company, and drains from each to carry off the water, bathing once or twice a day being essential for health in this climate.
13. The cooking means are bad. The buildings being temporary only, others are being built. There are no means whatever of supplying water, excepting by one of the water carriers or bheesties, two being allowed to a full company, which is quite insufficient. There are no drains whatever for draining off the refuse water from the present temporary buildings. There is no convenience for washing linen but the open air, which is well enough in dry weather. A drying shed would be most useful, and the holes containing water in which they now wash might be greatly improved at very little expense.
14. Privies are now being built, but since troops have been stationed here the men have gone wherever they could find a place, generally in the neighbourhood of Her Majesty's jail, which has never been cleansed or taken away.
15. The barracks are lighted at night with oil, in globe lamps.
16. The four native barracks are on the summit of a small hill, from whence the water runs off; there are no drains constructed. The barrack for the Europeans, on Pearl's Hill, is not well drained; an application has been forwarded to the executive department to have this very essential work performed immediately. The drainage from the temporary cook-houses is very indifferent. New cook-houses and privies are only now being erected. Urinals have never been in use with natives, and for the Europeans chatties and buckets are in use, which are emptied and cleansed by natives. No part of the buildings is damp. The drainage is generally sufficient for the barracks, and

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	will be attended to when the new cook-rooms are given over. The fluid refuse runs off, but what may remain occasionally is carried away by servants. There are no cesspits. Water is to be had within 50 or 60 yards from the new cook-rooms. The barracks are swept daily, and thoroughly cleansed once a week, as is also the hospital. The tidal nullah near the new privies is often very offensive, and is distant from the north barrack about 200 to 300 yards. The ditch in rear of the European barracks will be repaired, shortly; it being of earth only, it has become choked up. 17. A few prisoners, under the officiating barrack master, attend to the cleansing of the cantonment, but is not efficiently done, from the paucity of hands. The refuse and manure are carried away by the prisoners in baskets; a hand-cart has, however, been applied for. 18. The neighbourhood of the cantonment is surrounded by thick low brushwood, which ought to be removed. Applications have been submitted, but up to this period have been unattended to. The bazaar might be improved; the roads being very bad all over the station. Applications for having them repaired have been submitted, but have hitherto been very much neglected. The little bridges over the watercourses are all in a dangerous state for want of repair. 19. The bazaar is very small, and at this station is of very little use to the men, all going to the general bazaar. The troops are nearly altogether dependent for supplies on the shops in the town, which are altogether under the control of the municipal authorities. The native houses near the station have all more or less refuse, and dung-heaps near them; it being the custom of the Chinese to have them. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Animal food is seldom or never used by the native soldiery. All use it in their own country, but from its excessive dearness in Singapore, none are able to purchase it; goat mutton being nearly 2*s.* a pound, and good mutton 2*s.* 6*d.*; therefore, no animals are slaughtered except for the gentry. 21. The officers only have horses or ponies. These are all kept in stables near their houses; the manure being generally used for garden purposes. 22. There are only eight ponies attached to the mountain train guns. These are kept in stables at some distance from the barracks, and the manure is carted away. There are no picketing grounds. 23. There are only four houses in the cantonment for officers, hence they are compelled to take quarters wherever they are to be had, at an expensive rate. The officer commanding generally occupies the house of an absent merchant, which he is compelled to vacate on the merchant's return. The native soldier has no family with him, and for the few Europeans who have families there is sufficient accommodation.
Officers' Quarters.	1. The four houses before alluded to are in very bad repair, and their owners are unwilling to lay out on them more than is absolutely necessary to prevent their falling into ruins. Houses out of the lines are let far beyond the means of regimental officers, the rents ranging from forty to eighty dollars. No fault is found with their drainage and ventilation. Two of the officers of the European Artillery have good public quarters assigned to them. It would be a real boon if Government were to build suitable quarters for all commissioned ranks, and charge house-rent for them, as officers, from their short stay at Singapore and ignorance of Malays, are unable to build for themselves.
IV. Health of the Troops.	1. The station and district are healthy in a marked degree. 2. Cholera very seldom visits the Straits. Small-pox occasionally occurs, but is seldom very virulent. A tendency to skin diseases is observed; and among the Chinese ulcers of the legs are rather prevalent, attributable in part to their gross feeding, the fattest pork and salted vegetables forming an important part of their diet. Diseases of the spleen seldom occur. 3. I attribute the healthiness of the native population to the good climate and the facilities of earning a livelihood. The troops suffer from being deprived of animal food, and the severe duties they are called upon to perform, as also, absence from their families. 4. The 40th Madras Native Infantry were nearly three years in Cuttack, during which time however they were employed against the rebels at Sumbulpore, when the regiment was prostrated and almost disorganized by jungle fever in a few months from active employment during the unhealthy season of the year. They left Cuttack on the 26th December 1859, and arrived here in rather a weakly state on 22nd January 1860, and being without their families, became depressed and rapidly filled the hospital with cases of diarrhœa, rheumatism, and ulcers, which in many cases proceeded from itch pustules, indicating a very low tone of health. The barracks are very good quarters for the men, but owing to the sudden arrival of the 11th Punjab Regiment, the men are too much crowded at present. 5. They are not camped out, nor would it be advisable in this damp climate. It would be moreover very expensive, as a new tent only lasts a very few months. 6. I have never been in charge of troops at hill stations. 7. I have not observed whether troops are more or less liable to disease on returning to the plains. 8. I approve highly of selecting hill stations for troops. 9 and 10. I am not informed whether there are diseases peculiar to hill stations, nor whether any special precautions are necessary as to diet, clothing, &c. 11. The hot seasons are best adapted for residence in hill stations, and six months at least is the shortest period in which benefit to health can be obtained. 12 and 13. No information. 14. It would appear to be highly desirable to locate troops on hill stations. A residence at the hills during the hot season is most desirable for an officer, and is generally attended with benefit, and therefore would appear to be equally conducive to the health of the soldier. 15 and 16. No information. 17. There is no higher ground near this station of sufficient extent to locate troops on.

SINGAPORE. STRAITS SETTLEMENTS.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	18. Much difference has not been noticed as to the effect on health of surface or subsoil, provided the climate is good, the site elevated, and the soil not too retentive. A gravelly soil is of course to be preferred. 19. The best age for soldiers proceeding to India is from 18 to 24; and the best period in Madras and Bengal is about the end of October, and in the Straits about the middle of December. We have no experience at Singapore how troops are disposed of on first landing. When a detachment of Europeans or a regiment of natives arrive, they are invariably located in the buildings vacated by the relieved corps or detachment. The precautions to be observed on first landing in India are, avoidance of excessive sun-heat, exposure to the dews at night, indiscriminate eating of fruits, but above all, the drinking of spirits, especially that procurable in the bazaars, which in most stations, but especially at Singapore, are drugged. 20. Stations known to be healthy ought to be selected for Europeans on their first arrival in India, and until they get acclimated, long marches, or indeed any extra fatigue, ought to be avoided. They should be sent to hill stations or others known to be healthy. 21. We have no experience here of the transport of troops from the port to the interior, the barracks being within one to one and a half mile of the place of disembarkation. 22. Soldiers should serve in India from 20 to 25 years. 23. Medical boards are generally conducted with impartiality and sound discretion. No suggestions to make. 24. Invalids should leave India for home about the end of February at the latest, by the Cape route.
Diseases.	1. There are inspection parades once a week for the discovery of incipient disease. 2. There has been no scorbutic disease at Singapore. 3. Amongst the natives hepatic disease is little known. 4. Dracunculus does not occur here, except when an occasional case has been imported from Hindoostan. 5. The proportion of venereal cases amongst natives is about one per cent. Were a local corps formed, so that the men could have their familes with them, this would be diminished. A lock hospital is scarcely necessary at Singapore. 6. Epidemics are scarcely known, and endemic diseases are rare. The troops suffer occasionally from intermittent fever and rheumatism, rarely from anything else. Cholera is scarcely known; small-pox very seldom; rheumatism is rather common. The Director-General's records can alone supply the statistics of disease and death, as the present regiment has only been here a few months, and other regiments carry their records with them when they leave. 7. Small-pox is the only infectious disease observed, and that very rarely. Itch, in an aggravated form, is, however, too common; more so than in most Indian stations. There is no particular season when these diseases are most prevalent. The personal habits of the natives are not cleanly, and this, with the want of proper lavatories, predisposes to itch. 8. Epidemics are not prevalent in this station. 9. Quinine is not necessary as as a prophylactic. 10. No recommendations are necessary as to the prevention of epidemic disease.
V. INTEMPERANCE.	1. The soldiers at the station are temperate. There are one or two confirmed drunkards in the detachment of Europeans, which consists of about 50; there are none amongst the natives. 2. The proportion of diseases occasioned directly or indirectly by intemperance cannot be given, the medical officer with the detachment of Europeans being changed every five or six weeks, and the statistics of the native regiment having been taken away with the relieved regiment. Drunkenness is invariably punished as an offence. 3. Distilled spirits are sold at the canteen and are good; those in the bazaar are of a bad description, often, it is to be feared, drugged. The average amount consumed per man is about a dram per diem. Spirit is no part of the ration, and none are ever issued before noon. It is never given as a ration to convalescents. No other kinds of drink injurious to health are sold in the canteen. 4. The consumption of spirits in moderation is not injurious to health; it is certainly not conducive to efficiency and discipline. 5. There are no spirits issued as rations; and, if not sold in the canteen, many men would purchase inferior liquor in the bazaars. It is to be feared, therefore, that the sale in the canteen cannot now be abolished. 6. There can be no doubt that malt liquor is preferable to spirits; wine is too expensive. 7. Tea and coffee are issued as a ration to the Europeans and are much used by the native soldiery. Every inducement should be given for the men to drink malt liquor, as conducive to health. 8. The suppression of the sale of spirits cannot be done, for after a man is accustomed to spirits he will not be contented without them. 9. Many men would not be contented with beer or any less stimulating beverage than the spirits they have been accustomed to. 10. A good supply of malt liquor should be always available for European troops, to induce them to avoid drinking spirits. 11. Rules for the management of canteens, G. O. 17th August 1855 and G. O. 13th March 1857.
VI. DIET.	1. The ration for British troops consists of 1 lb. of bread, 1 lb. meat, 1 lb. vegetables, 4 oz. rice, $\frac{4}{7}$ oz. tea or $1\frac{4}{7}$ oz. coffee, $2\frac{1}{2}$ oz. sugar, 1 oz. salt, 3 lb. firewood. The rations are inspected by the commanding officer. 2. A complete ration, including 1 lb. vegetables, is issued daily by Government, for for which there is no actual stoppage. There are three meals a day, breakfast at 8, dinner at 1, supper at 6. 3. Europeans in the Straits never have mutton served out to them, it being considered too expensive, but it is most desirable they should have it once or twice a week.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	Europeans never sell their rations, and every discouragement is given to prevent the natives doing it. 4. The cooking is performed in copper and iron vessels provided by the Government. The kitchens are the ordinary native buildings, and water is supplied by water carriers. The meat is neither boiled nor roasted, it being generally beef, which is either stewed or curried. The beef is too tough to be roasted; in other respects it is properly prepared. The men have never marched at Singapore, all movements taking place by water. 5. Gardens might be advantageously established both for Europeans and native soldiers, and should be under regimental arrangements.
VII. Dress, Accoutrements, and Duties.	1. There being no cold weather, the khakee is usually worn by the Europeans and by the natives, with the exception of the months of December and January. The khakee is at present cotton; thin woollen would be preferable both for Europeans and natives. I would recommend the woollen khakee of a dark grey colour and the felt helmet for Europeans and natives with a due regard to the prejudices of the latter. Cotton khakee jackets and trousers and wicker helmets is the present dress for Europeans; the white jacket and dark cotton trousers with the Madras regulation pugree for natives.
Duties.	1. It would certainly be advisable that Europeans should be drilled at home, and natives before being sent to the Straits ought to be thoroughly drilled and fit to join the ranks before being sent from India. 2. There are parades or drills five times during the week in the mornings and twice in the afternoons. The best hour for drills is half an hour before and after sunrise and sunset. The orders are that no regiment is to be under arms between 8 a.m. and 4 p.m. Europeans have three out of four nights in bed; natives, two out of three. 3. The European guards are mounted quite close to the barracks. Natives at various distances up to three miles. There are no roll calls after 8 p.m. except as a punishment. Night guards are very prejudicial to health, and on this account it is most desirable men should not be on duty more than once in five or six days.
VIII. Instruction and Recreation.	1. The only means of recreation and instruction at the station are a skittle ground and a library and reading room, which is kept up by the men. A little assistance from Government would be very acceptable. There are no schools, ball courts, day rooms, gardens, workshops, theatre, or gymnasia. There is sufficient to keep the men occupied if so inclined, the library being good. There is no restriction on the men confining them to barracks when off duty, and the plan appears to work well. 2. Gardens are most desirable, also fives' court and cricket. 3. Savings' banks are established, and would be made more use of if the interest were better. 4. There is no shade from trees, verandahs, &c. to enable the men to take exercise during the day.
IX. Military Prisons.	1. There is no military prison at Singapore. There are three cells which might be improved.
X. Field Service.	1 to 4. Not applicable to the station.
XI. Statistics of Sickness and Mortality.	1. Statistics are only to be procured at the office of the Director-General, Medical Department, Madras.
XII. Hospitals.	1 to 4. No replies. 5. Both the hospitals are on hills, and are in consequence naturally well drained, the water falling from the roof into trenches which lead to outlets in the compound wall, whence it is rapidly carried off. Both the hospitals are built of brick and chunam, with tiled roofs and single walls. They are very well ventilated and both are very cool. They are supplied with verandahs on both sides, which afford sufficient shelter from the sun and rain. Convalescents occasionally occupy the verandahs when the sick list is large, but they are further protected by an outer verandah of palm leaf supported on poles, a very useful adjunct to all Indian hospitals. The hospitals consist only of one flat. The following table gives the hospital accommodation:— Date of construction, European, 1845; native, 1831. Total number of wards, 1 European, and 1 native. Total regulation number of beds, 65 in the native hospital, and about half that number in the European.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft.		Ft.	Ft.
Native, 1 - -	65	90	30	15	40,500	623	41	2	10 and 9 doors 9 ft. by 4½ ft.	6	4
European, 1 - -	60	60	35	22	47,300	945	43	2	12 and 4 doors 10 ft. by 5 ft. with 16 ventilators.	10	4½

SINGAPORE. STRAITS SETTLEMENTS.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	There is no obstruction to the wind from any quarter, but low hills moderate the effect of the sea breeze, which is rather an advantage than otherwise at this station, where the wind from the sea is often hot, if not injurious in some degree. There are no glass windows, but venetians that open like folding doors, and conduce much to ventilation. 6. There are large square openings in the ceiling of the wards, which are excellent means of ventilation in hot climates and ought to be more general, and air has free access above and below the floor, enough to keep the wards free of odour *if not overcrowded.* The jalousies are of venetian, like folding doors. 7. No means of cooling the air are in use at the native hospital. In the European hospital there are punkahs suspended. 8. No means of warming are required. The walls and ceilings are limewashed once in six months, and oftener if required. 9. The privies are sheds built of brick and chunam and tiled. They are situated at the two corners of the compounds, with compartments in which there are perforated seats with buckets. They are properly drained and supplied with water, and are not offensive, means being taken for the removal of all filth. 10 and 11. The lavatory arrangements consist of bathing tubs, besides a bath room containing a fixed bath of masonry, in which the patient can have either hot or cold water. The European soldiers seldom and the native never use washhand basins. 12. Regimental washermen are paid for washing and drying the hospital linen, and are generally found sufficient. 13. The means of storage are sufficient. 14. The bedsteads consist simply of two or three planks, when put together being 6 feet by 2½, and supported by trestles. Each bed for a European has a mattress stuffed with straw or cocoa-nut fibre, and the native has his carpet or cumbly. 15. The cook-houses are in the hospital compound. They have no apparatus beyond what is furnished from the bazaar, which has hitherto been found sufficient. The diet is ordered by the medical officer, and is on a liberal scale for the sick. 16. There are no diet tables, diets being furnished as daily directed by the medical officer. Statistics of sick are not kept here, all reports being sent to the Director-General. The medical officer in charge of the Europeans is generally changed every two or three months, which is against the internal economy working well. 17. There are hospital serjeants for attendance on the sick at all the hospitals, and orderlies are furnished at the requisition of the medical officers. 18. The hospitals are well constructed, but on the arrival of the 40th Madras Native Infantry with numbers of weak men, they soon became overcrowded and hospital gangrene began to show itself, but on immediately removing a number of the sick to a temporary building, the disease rapidly disappeared. 19. No sanitary defects have been observed beyond the want of extra accommodation on emergencies. 20. The convalescents are allowed to walk out on the public roads, which are very dirty and always dusty. Shady walks and seats are unknown at Singapore. 21. The wives and children of soldiers are attended in their own dwellings. Shady walks and seats would be a great boon to the sick; even the esplanade where the bands play has not a single seat. 22. There are no special local hospital regulations. 23. Any reasonable suggestions of the medical officers are invariably complied with. They can also obtain on indent wine, meat, and bread and milk for extreme cases. 24. There is no hospital or ward for convalescents. Such an accommodation would be an advantage to the station. Empty buildings have usually been given for the use of convalescents. At present, from the unexpected arrival of another native regiment, there are none available.
XIII. BURIAL OF THE DEAD.	1. The burial ground used by British troops is about a mile east of the station, which is no inconvenience. Chinese burying grounds abound in every direction, and require to be better controlled. 2. The British burial ground is carefully kept, and being on a hill, is well drained. A new one is under the consideration of the Government, the old one being close under the walls of Fort Canning on the Government Hill. 3. In the burial grounds for Europeans sufficient interval between graves is always allowed, and all natives are buried under municipal arrangements. It has not been necessary to reopen graves for Europeans, and is not practised by the natives. At all times in this country burial takes place a few hours after death, or as soon as arrangements can be made. Natives bury at several places, the nearest being close to the parade ground. 4. The European grave-yard is never offensive, but those of the Chinese are very often so. This is under municipal arrangement, and no complaints have been made for the past year, attention having been called to the nuisance. The Europeans are buried in the Government burying ground. 5. The dead of camp followers and bazaar people are disposed of under municipal regulations. 6. No complaints of injury to the public health have been made to the municipal authorities. 7. We would suggest as an improvement that all the burial grounds should be removed to a distance, many being too near dwelling houses.

(Signed) GEORGE BURN, Colonel.
CHARLES EDWARD FABER.
WILLIAM TRAILL, M.D., *Assistant Surgeon, 40th Regiment Native Infantry.*

Singapore. No date.

REPORT BY PRINCIPAL INSPECTOR-GENERAL PEARSE.

PRINCIPAL INSPECTOR-GENERAL PEARSE'S REPORT on the MADRAS STATIONS.

STATIONS.	REPLIES.
	1. The Principal Inspector-General of Hospitals, Madras Medical Department, has the honour to transmit the following report, in reference to section 14 of the list of queries issued by the Royal Commission appointed to inquire into the sanitary condition of the Indian army.
TOPOGRAPHICAL REPORTS.	2. Between the years 1842 and 1845 a series of reports compiled under the direction of the Madras Medical Board, by the then secretary, Dr. Pearse, now Principal Inspector-General, Medical Department, were published by the local Government, comprising a medical topographical account of every station in the presidency occupied by European or native troops. Copies of these reports are herewith forwarded for the information of the Royal Commissioners. Although many alterations and improvements have been carried out in hospitals, barracks, &c., subsequent to the date of these reports, still the topographical descriptions of stations are very complete, and may be consulted with advantage in the framing of a general report on the sanitary condition of the various military stations within the Presidency. Since the date of publication several new stations have been occupied in the province of Pegu, but as a topographical account of each station will reach the Commission through the local military and medical authorities, it will not be necessary to enter into the subject here.
	3. Below will be found lists of all important stations occupied by European and native troops, arranged according to their order of salubrity. It is necessary, however, to offer some general remarks with regard to these tables. They have been compiled for a period of ten years—from 1847 to 1856–7; and during this period the Madras army was not employed in the field, with the exception of a portion thereof engaged in the second Burmese war, in 1852–3. The death-rate of each station does not of course show the actual mortality resulting from disease contracted thereat. Many of the stations show a higher rate of mortality than is attributable to the particular locality, occasioned by casualties amongst invalids transferred from other stations. The cantonment of Saint Thomas's Mount, occupied permanently as the head-quarters of the Madras Artillery, is an example of this. It is considered a healthy station for Europeans, and yet the mortality is very high, consequent on the transfer of sick from foreign service and up-country stations to head-quarters.

No. 1.

TABLE of PRINCIPAL STATIONS occupied by EUROPEAN TROOPS, arranged according to their Order of Salubrity, calculated on the average of 10 Years, from 1847 to 1856–7.

Ratio per 1,000 of Sickness to Strength.		Ratio per 1,000 of Deaths to Strength.		Ratio per 1,000 of Deaths to Strength, including those from Cholera.	
1.	Wellington (*3*) - 1,001	1.	Jaulnah - 10·3	1.	Jaulnah - 9·3
	Bangalore - 1,417		Cannanore - 17·9		Bellary - 13·2
	Cannanore - 1,514		Bellary - 18·0		Bangalore - 15·4
	Tonghoo (*5*) - 1,534		Bangalore - 19·0		Trichinopoly 17·4
5.	Rangoon (*5*) - 1,630	5.	Trichinopoly 19·7	5.	Cannanore - 17·7
	Bellary - 1,761		Secunderabad 24·5		Secunderabad 24·0
	Saint Thomas's Mount 1,761		Kamptee - 28·6		Kamptee - 25·1
	Trichinopoly - 1,814		Madras - 29·6		Madras - 27·1
	Secunderabad 1,825		Wellington (*3*) 34·1		Wellington (*3*) 31·2
10.	Madras - 1,834	10.	Saint Thomas's Mount 38·6	10.	Rangoon (*5*) - 35·1
	Kamptee - 2,015		Tonghoo (*5*) - 42·8		Saint Thomas's Mount 37·3
12.	Jaulnah - 2,368	12.	Rangoon (*5*) - 48·2		Tonghoo (*5*) 40·7

The *Italic* figures indicate the number of years for which average has been obtained.

No. 2.

TABLE of STATIONS occupied by NATIVE TROOPS, arranged according to their Order of Salubrity, calculated on the average of 10 Years, from 1847 to 1856–7.

Ratio per 1,000 of Sickness to Strength.		Ratio per 1,000 of Deaths to Strength.		Ratio per 1,000 of Deaths to Strength, including those from Cholera.	
1.	Malacca - 374	1.	Quilon - 6·8	1.	Hurryhur - 4·9
	Kurnool - 547		Jaulnah - 7·3		Vellore - 5·6
	Cannanore - 598		Bellary - 7·8		Bellary - 6·1
	Kamptee - 611		Cannanore - 8·4		Jaulnah - 6·4
5.	Penang - 647	5.	Secunderabad 8·5	5.	Quilon - 6·5
	Mangalore - 650		Paulghaut - 9·1		French Rocks 7·01
	Vellore - 660		Hurryhur - 9·6		Secunderabad 7·1
	Samulcottah - 693		Bangalore - 10·1		Madras - 7·2
	Jaulnah - 727		Mangalore - 10·2		Paulghaut - 7·6
10.	Hurryhur - 748	10.	Masulipatam - 10·2	10.	Cuddapah - 7·6
	Bellary - 772		Vellore - 10·4		Trichinopoly 7·8
	Secunderabad 772		Madras - 10·5		Kurnool - 8·0
	Palamcottah - 774		Kurnool - 10·5		Cannanore - 8·4
	Quilon - 787		Malacca - 10·8		Palamcottah - 8·6
15.	French Rocks 787	15.	French Rocks 11·6	15.	Malacca - 8·7
	Madras - 807		Kamptee - 11·9		Bangalore - 9·1
	Berhampore - 824		Cuddapah - 12·04		Kamptee - 9·7
	Cuddapah - 837		Samulcottah - 12·2		Masulipatan - 9·8
	Paulghaut - 839		Mercara - 14·4		Mangalore - 10·2

SPECT.-GEN. PEARSE'S REPORT. MADRAS.

STATIONS.

Topographical Reports—*cont.*

REPLIES.

Ratio per 1,000 of Sickness to Strength.		Ratio per 1,000 of Deaths to Strength.		Ratio per 1,000 of Deaths to Strength, including those from Cholera.	
20. Trichinopoly	858	20. Palamcottah	15·9	20. Mercara	10·9
Bangalore	900	Trichinopoly	16·1	Samulcottah	11·3
Vizianagrum	966	Vizagapatam	16·3	Berhampore	13·5
Masulipatam	972	Penang	17·2	Meaday (*1*)	15·1
Mercara	985	Singapore	17·3	Vizagapatam	16·1
25. Singapore	1,035	25. Rangoon (*4*)	17·7	25. Vizianagrum	16·8
Rangoon (*4*)	1,358	Meaday (*1*)	19·6	Singapore	17·1
Vizagapatam	1,383	Vizianagrum	19·8	Penang	17·2
Moulmein	1,512	Berhampore	20·2	Rangoon (*4*)	17·6
Tonghoo (*4*)	1,831	Tonghoo (*4*)	21·9	Tonghoo (*4*)	19·5
30. Henzada (*2*)	1,996	30. Moulmein	22·8	30. Moulmein	20·8
Meaday (*1*)	2,504	Labuan (*8*)	29·1	Labuan (*8*)	29·1
32. Labuan (*8*)	2,714	32. Henzada (*2*)	29·2	32. Henzada (*2*)	29·2

The *Italic* figures indicate the number of years for which average has been obtained.

4. In remarking upon the different stations occupied by European troops, it may not be amiss to begin with the station which shows the lowest death-rate of all, viz., Jaulnah.

JAULNAH.

5. Jaulnah is a considerable town and military station in the Hyderabad country, situated in north latitude 19° 0′ 50″, and east longitude 76°. It has for many years been occupied as a station for a troop of European horse artillery, a native cavalry corps, and one or more of native infantry. The elevation of the cantonment is 1,652 feet above the sea. The climate is that common to the Deccan. The hot season begins in March, and terminates usually in the beginning of June. The thermometer in the middle of the day, at this period of the year, ranges from 90° to 100°, but the mornings are generally fresh and comparatively cool. This is stated to be the healthiest season. The rainy season extends from the middle of June to October, the average rain-fall being 32 inches. The cold season extends over the following months:—November, December, January, February. The variations of temperature are very great at this season, the thermometer often ranging from 40° to 80°, and in the early mornings ice has been known to form on plants or evaporating surfaces. The prevailing winds are northerly or easterly, and are particularly cold and piercing. The Medical Board in 1844 thus remarked on the climate of Jaulnah:—

"The climate is considered to be one of the most salubrious and pleasant in Southern India. During the greater part of the year a fresh invigorating coolness is experienced in the mornings, yet convalescence from serious attacks of disease is almost invariably slow and imperfect, and a change of air, especially to the sea coast, is generally found requisite for the restoration of health."

As before observed, the only European force stationed here was a troop of horse artillery. In the beginning of 1857 the station was abandoned as a military post, but after the breaking out of the mutinies it was again occupied, and the wing of a European regiment was quartered there, in addition to the troop of horse artillery. The barracks and hospital accommodation for the limited number of men comprising a troop of horse artillery are good and ample. The buildings occupy the highest ground in the cantonment, and the natural drainage is good. For the ten years ending 1856-7 the admissions to hospital were 236 per cent. to strength, but the mortality scarcely exceeded one per cent. (*per annum?*). Jaulnah is so far away from any sanitarium that no men seriously ill could be transferred, especially during the rainy season, when the roads in the Nizam's territories are almost impassable.

The low death rate, therefore, cannot be accounted for on any other grounds than the great salubrity of the climate, and its suitability to the European constitution. With such wide variations in temperature, it is but reasonable to expect that colds and slight febrile attacks would be common, and these, in fact, with bruises, contusions, &c., to which all mounted soldiers are liable, appear to have occasioned the large proportion of sickness, compared with the deaths. The climate of Jaulnah appears to suit the native soldier equally as well as the European; the admissions, to strength, being at the rate of 727 per thousand, and the deaths 7·3 per 1,000 (*per annum?*). It will be observed that the mortality from cholera has been slight, both amongst Europeans and natives. In the whole Madras army cholera causes one-fourth of the mortality.

Epidemics of small-pox and cholera occasionally visit the station, but the former must always be looked for in a part of the country where vaccination is almost unknown. The latter is of comparatively rare occurrence. The very agreeable climate of Jaulnah, the extraordinarily low death rate—the lowest, it is believed, of any station in India, and considerably below that of the same class of men in garrison towns at home—would seem to point it out as a desirable spot for the permanent location of a European regiment, should military considerations permit of the suggestion being carried out.

His Excellency the Commander-in-Chief, on his late visit to the station, selected a piece of ground admirably adapted for barracks, and Dr. Macpherson, Inspector General of Hospitals, who accompanied his Excellency, reports most favourably of the site. The 3d Regiment Madras Europeans has lately occupied the station, but there are no proper barracks for their accommodation.

CANNANORE.

5. *Cannanore.*—The town of Cannanore is situated on the western coast in the province of Malabar. For a minute topographical account of the station it is requested that reference may be made to the "Medical Board's Report on the Medical Topography and Statistics of the Provinces of Malabar and Canara" (pp. 2, 15). The salubrity of this place and its appearance as second in the list of healthy stations, appears to depend in a great measure on its remarkable freedom from epidemics of cholera as regards the European and native military forces.

Cholera sometimes prevails amongst the towns-people, whose habits are filthy, and who live in dirty ill-ventilated houses and narrow streets, but it rarely attacks a European or native soldier. The Medical Board stated in 1844, that cholera had never been known to appear in Cannanore until 1838, when it proved very fatal to the poor in the town and cantonment bazaars, which were very filthy, but in the sepoy lines, "which are on open ground, and kept remarkably clean," scarcely a single case of the disease occurred. For the ten years

STATIONS.	REPLIES.
Cannanore—*cont.*	to which this report refers, only two deaths occurred from cholera amongst the European troops, and not one in the native force, the aggregate strength being respectively 9,338 of Europeans, and 14,504 of natives. It is a remarkable fact, and which will be noticed more particularly hereafter, that European and native military on the western coast of the provinces of Malabar and Canara enjoy almost an immunity from cholera. The subject was noticed in the annual report on the health of the army, European and native, for the year 1856–7. It is there shown that for a period of 15 years, during which the aggregate strength of the European force was 14,441, only 15 deaths from cholera occurred, and the native troops, numbering in the aggregate 49,389, lost only 61 men from this cause. This immunity of the troops is not easily explained, for the native population generally suffer severely during cholera epidemics. In the latter part of 1859 the disease prevailed throughout the provinces of Malabar and Canara, destroying large numbers of the population. In the gaol of Calicut, a well-ventilated and commodious building, in which 400 prisoners were confined, cholera in a few weeks swept away more than one-fourth of its inmates. A detachment of European infantry, numbering 100, during the same visitation, escaped with the loss of one man. It will be seen that Cannanore does not rank so high in the list of healthy stations if the cholera cases are excluded. The climate is undoubtedly relaxing, and a prolonged residence therein conduces to deterioration of health. Dysentery is a common and often fatal disease. Malarious fevers are infrequent. Venereal diseases are common, and chancres are apt to assume a phagedenic form in weakly or unhealthy men, but as lock hospitals for the reception of diseased women have lately been established, it is hoped that fewer admissions from these diseases will occur at this and other stations occupied by European troops. There is a tendency in almost all cases to assume a scorbutic form after a prolonged residence on the western coast. This was very marked in the case of Her Majesty's 25th regiment, which, after five years residence on the western coast, returned to Madras in 1849, enervated and worn out by the debilitating effects of the climate. Soon after their return the men began to suffer from scorbutic dysentery, and the mortality from this cause alone exceeded the average mortality of European troops at Madras from all diseases. It is noticed, moreover, that no fewer than 12 men died of tubercular phthisis in the same year, most of whom had been from 8 to 10 years in the service, and the medical officer attributed the excessive mortality from this disease to the depressed health induced by five years' residence in the moist warm climate of Malabar. It would therefore appear desirable that the relief of European troops stationed on this coast should always be effected at somewhat shorter intervals than is generally the case, and with this precaution there is no reason to suppose that the residence at Cannanore or other stations in these provinces would permanently impair the efficiency of regiments.
BELLARY.	6. *Bellary.*—For a topographical description of this station see the "Medical Board's Report on the Medical Topography of the Ceded Districts." Since the report was written a Sanitarium has been established on an isolated little hill 40 miles north-west of Bellary (Ramandroog), which will, however, be more particularly referred to in the list of Sanitaria for the Madras Presidency, and new and commodious infantry barracks have been built at Bellary to accommodate an entire regiment. But for the occasional outbreak of epidemic cholera in Bellary, the station would stand very high in the sanitary list. It has, however, been visited from time to time very severely by that dreadful scourge of our Indian plains. From the medical board's report above referred to, it is observed that the death rate of Europeans stationed in the ceded districts from 1829 to 1838 was 31 per thousand, and of native troops 16 per thousand. For a later period of 14 years, viz., from 1842 to 1856–7, it was 34 per thousand in European troops, and the native mortality remained exactly the same, viz., 16 per thousand. The diminished value of European life in the later period has been due entirely to losses from epidemic cholera. This will be more easily seen from the following table:—

——		Aggregate Strength.	Total Deaths.	Deaths from Cholera.	Per-centage of Cholera Deaths to whole Mortality
From 1829 to 1838	European	9,000	285	62	21·75
	Native	35,999	581	283	48·7
From 1842 to 1856–7	European	10,400	359	201	55·9
	Native	56,437	937	488	52·08

Although the station of Bellary itself does not show the above high rate of cholera mortality, yet for the 10 years to which these remarks and the foregoing tables refer, the cholera deaths were 26·6 per cent. of the whole, a very high rate for any cantonment or station. It is observed that troops passing through the ceded districts often suffer very severely from cholera epidemics. Thus, in 1854, a detachment of recruits for the 3rd Madras European Regiment was attacked when within one stage of Bellary, and in a few hours some 30 or 40 men were prostrated, and the medical officer in charge (the late Dr. Cheyne) was seized with and died of the disease. On this occasion the recruits were panic-struck, and many of them hurried off to the cantonment, where fortunately very few cases occurred after the men had been comfortably settled in barracks. From 1854 until the beginning of 1859 the district remained comparatively free from cholera, in fact, no cases occurred at Bellary; but at the latter period the epidemic was general throughout, and the civil and military stations of Kurnool, Cuddapah, Ghooty, and Bellary suffered severely. It is not easy to account for the greater mortality of troops from cholera in the ceded districts than in other divisions of the army. Various explanations have been attempted, but none of them are satisfactory.

A more minute acquaintance with the laws regulating the progress of this mysterious disease will probably lead, at some future time, to a satisfactory explanation of the facts noted. In the meantime, it would be well to bear in mind the following remarkable statistics of two districts or provinces, differing widely in point of geological formation, elevation, temperature, moisture, rain-fall, &c.

Inspect.-Gen. Pearse's Report. Madras.	Stations.	Replies.
	Bellary—*cont.*	The per-centage of deaths from cholera to the total mortality for a period of 15 years in the Malabar and Canara provinces was— ,, - Europeans - - - 4·6 ,, - Natives - - - - 12·4 Ceded districts - Europeans - - - 55·9 ,, - Natives - - - - 52·8 If the mortality from cholera is excluded, the deaths in Bellary for the 10 years to which the tables refer amounted only to 13·2 per thousand of Europeans, and 6·1 per thousand of native troops. The station has the great advantage of an isolated hill sanitarium within 40 miles, to which weakly men, or those convalescing from acute disease, are often advantageously transferred. With new barracks, and recent sanitary improvements in the bazaars, which formerly were hotbeds of cholera, and with a railway now in course of formation, by which troops can hereafter be moved to and from the station without exposure to the choleraic poison, often so prevalent in the district, there is every reason to hope that the mortality will be found to be considerably lessened in the returns for the next decennial period.
	Bangalore.	7. This station has for many years been occupied by the head-quarters of the Mysore division of the army. Situated on a high table land, at an elevation of 3,000 feet above the sea, it possesses perhaps the most agreeable climate for Europeans of any station in India. (For a minute description of the topography of Mysore, see Medical Board's report.) Although this admirable climate is highly appreciated by European troops, yet it is found that much sickness often prevails amongst them. There is no doubt that many men, forgetting that they live in a tropical country, expose themselves too much in the daytime, and suffer in consequence from fevers, hepatic affections, dysentery, &c. Cholera has been known to prevail seriously in many parts of the Mysore country of late years, and the troops at Bangalore enjoy no immunity from this disease. The number of admissions to hospital according to strength is lower at Bangalore than at any other station, excepting Wellington (the new military station on the Neilgherries), but as regards the mortality, Bangalore stands fourth on the list. The present barrack accommodation for the European dragoon regiment is not sufficient, but spacious barracks, possessing every advantage in site, ventilation, and sanitary requirements generally, are now in course of erection, and when completed will be second to none in India. A lock hospital, for the reception of women affected with venereal diseases, has been for the last four or five years in operation at this station, and although no coercion is used to bring them to hospital, it is satisfactory to know that these diseases are abating in virulency and frequency. If the European soldier could be kept from imprudences in eating, drinking, and solar exposure, Bangalore would be probably the healthiest, as it is certainly the most agreeable, residence in India.
	Trichinopoly.	This is the principal military station and head-quarters of the southern division of the Madras army. It is situated in north latitude 10° 50′, and east longitude 78° 44′, on the southern bank of the river Cauvery. This is perhaps the hottest station in the presidency, the mean temperature for the year being 85°, as ascertained by accurate observation. The temperature ranges between 102°, in the hottest part of the year, and 68°, the minimum in the cold season. The troops at this station generally consist of one regiment of native cavalry, one battalion of artillery, one regiment of European infantry, and two or three of native infantry. It is noticed by the Inspector-General of Hospitals, D. Macpherson, M.D., in his late report on this station, that the wet cultivation which has sprung up of late years in connexion with irrigation works on the Cauvery river, has, to a certain extent, changed the dry arid heat of the atmosphere during the hot months of the year to a temperature much more bearable, and the salubrity of the station appears to have been improved by it. The artillery barracks are spacious and well ventilated, but the European infantry barracks are somewhat deficient in these respects, although the latter have been improved of late years. There is a project now under consideration by the local government to build new barracks, arsenal, magazines, &c., within a fortification, on a site lately selected and approved of by his Excellency the Commander in Chief, as Trichinopoly is a position of great military importance. Although hot, the climate is generally not considered unhealthy, and of late years there has been a manifest improvement in the sanitary condition of European troops in the southern division, for which the only permanent station is Trichinopoly. Thus the death-rate per thousand from 1829 to 1838 was 39. ditto, from 1842 to 1856–7, 29. The later years of the report show a reduced rate of mortality, so that for the period noticed in the tables it amounted to 19·7. During the official year 1858–9, a period subsequent to the foregoing tables, the 2nd Madras European Light Infantry was stationed at Trichinopoly, average strength 699, 10 men only died in hospital, three from cholera, two from disease of the heart, not the result of climate, four from dysentery and hepatic disease, and one from sun stroke. For the whole official year, the death rate in this regiment did not exceed 14 per thousand. Trichinopoly, like most other stations in Southern India, is liable to epidemic outbreaks of cholera, commencing generally after the north-east monsoon rains, which usually fall in October and November. On looking over the monthly returns of the various regiments, European and native, for the 10 years under notice, it is remarkable how regularly the cholera season sets in with the cold north-easterly winds, which blow regularly from November to March in each year. Occasionally a few cases are found in the returns for the hotter months, but these are evidently sporadic. The disease does not prevail in the epidemic form during the hot weather. In Central India, the North-west Provinces, and Bengal, it is usually found that cholera prevails, and causes the highest mortality in the hottest months of the year. In Southern India the reverse of this is the case, and here is another peculiarity, not generally known, connected with this mysterious disease. Why it should spread readily and with rapidity at one time of the year in one place, and at a different period in another place, is strange, and in the present state of our knowledge, inexplicable.

STATIONS.	REPLIES.

SECUNDERABAD.

This important military post in the territories of his Highness the Nizam has for many years past been occupied by a large force of European and native troops.

Prior to the mutinies of 1857, the following number of corps, &c. were located there:—

1 troop Horse artillery.
Head-quarters and 2 batteries of a battalion of European artillery.
1 regiment native cavalry.
1 regiment European infantry.
5 do. native do.

Since the great influx of European troops subsequent to the mutinies, the force at Secunderabad has been as follows:—

2 batteries Royal artillery.
1 battery Madras European artillery.
1 regiment European cavalry.
1 do. native do.
2 do. European infantry.
4 do. native do.
1 company Sappers and Miners.

The medical topography of Hyderabad, and the station of Secunderabad, will be found fully described in the Medical Board's reports previously referred to. Since the date of these reports, many additions and alterations have been effected in the barrack accommodation. The infantry barracks and hospital have undergone many improvements in a sanitary point of view. The surrounding native buildings have been cleared away from the neighbourhood of the hospital, and the ventilation and drainage of the barracks and privies have from time to time been improved. Large sums of money have been spent with the view of rendering these barracks more healthy for European soldiers, but hitherto with only temporary good effects. Great improvements were made in them about 23 or 24 years back, as regards ventilation, drainage, and better protection from heat and glare, and they subsequently proved healthy for some years. Epidemic dysentery and fever, however, again broke out, which led to the Medical Board expressing an opinion in 1844, that the site of the buildings was irremediably bad; their abandonment was recommended, and the new barracks in Trimulgherry were in consequence erected. The garrison, however, having been increased by an additional European regiment, the old barracks continued to be occupied, and contrary to expectation, the 3rd European regiment from 1854 to 1857, during which they were located in these very buildings, was a particularly healthy corps. The men improved in health and appearance, and in the last year of their sojourn at the station the mortality fell as low as 12 per thousand.

In the year 1853 a medical committee, by order of Government, reported on the barracks and condemned them, and fixed upon a site for new buildings. In the end of 1854 the new barracks at Trimulgherry were commenced, and in the beginning of 1857 were occupied by a wing of Her Majesty's 12th Lancers, and subsequently they have afforded accommodation to Her Majesty's 1st battalion 1st Royals, and two batteries of Royal Artillery.

The new barracks and hospital are considered the best, in point of ventilation, cubical contents, situation, &c., of any in the presidency. The water supply is good, but it appears that no special provision has been made for drainage from the privies, cook-rooms, &c., but as the "dry system of conservancy" is most applicable to all Indian cantonments in the plains, the omission is not of very grave importance. Arrangements are now in progress for carrying off spare water and liquid sewage.

The artillery barracks are situated on high ground to the north of the parade ground, one of the best sites which could be found in the neighbourhood. The buildings are not lofty, having arched, bomb-proof roofs, but capable of ventilation by open doors and windows. They are never overcrowded. A remarkable difference in the rates of mortality of the artillery and infantry at Secunderabad has been noticed, and this chiefly from the comparative exemption of the former from the peculiarly bad type of dysentery, which often prevails in the old infantry barracks. On the examination of the returns of sickness and mortality of Europeans stationed at Secunderabad for a period of 20 years, some very curious facts have come to light. It is shown distinctly that the mortality amongst the infantry regiments of Her Majesty's service has *nearly doubled* that of European regiments of the East India Company's service, *occupying the same barracks*, but at different periods. The following simple table has been constructed, with the view of showing this fact in a clear light.

Year.	Queen's Regiments.	Death Rate per Cent. to Strength.	Year.	East India Company's Regiments.	Death Rate per Cent. to Strength.
1838	H. M. 55th Regiment	7·49	1840	1st Madras Fusiliers	4·97
1839	Ditto	5·95	1841	Ditto	3·67
1843	H. M. 4th Regiment	10·92	1842	Ditto	4·15
1844	Ditto	6·24	1850–1	2nd European Light Infantry	2·55
1845	Ditto	2·98	1851–2	Ditto	6·27
1846	H. M. 63rd Foot	6·71	1852–3	Ditto	0·52
1847	H. M. 84th Regiment	3·52	1853–4	Ditto	1·33
1848	Ditto	2·64	1854–5	3rd Madras European Regiment.	5·65
1849–50	Ditto	2·63			
1858–9	H. M. 1st Battalion 1st Royals	9·64	1855–6	Ditto	2·11
			1856–7	Ditto	1·23
	Average for 10 Years	5·87		Average for 10 Years	3·87

Thus in the 20 years the mortality has been as follows:—

Queen's regiments located in the infantry barracks 58·7 per thousand.
Honourable Company's ditto 38·7 do.
Do. Artillery in artillery barracks 27·6 do.

The occurrence of the lower mortality rate in the artillery is explained by the fact that the men of this corps never suffer to any great extent from attacks of epidemic dysentery, as do

Inspect.-Gen. Pearse's Report. Madras.	Stations.	Replies.
	Secunderabad—*cont.*	the troops located in the infantry barracks. Dysentery is by no means uncommon amongst them in the unhealthy seasons which now and then prevail, but it is generally more amenable to treatment than the same disease in the European infantry. The artillery, however, are not so much exposed to night duties, and are better sheltered than the infantry; they, in fact, have only their own regimental guards to take, and this, as well as their having seasoned men, is doubtless the reason why they suffer less from climatic diseases than the other troops. The marked difference in the rates of mortality of the infantry of Her Majesty's and the Honourable Company's service respectively, is not so easily explained. The men of both services were exposed to unhealthy seasons, and as a rule suffered more in the first year of occupation than at any subsequent period. This is particularly marked in the case of Her Majesty's 4th King's Own 63rd Foot, and 1st battalion Royals in the years 1843, 1846, and 1858–9. Some Queen's corps have maintained a fair ratio of health in these barracks. Her Majesty's 84th, for instance, lost very few men during the three years of its occupation of the barracks. It does not appear that the difference of mortality is attributable to greater overcrowding in one class of regiments than in the other. Her Majesty's 55th regiment lost 7·49 per cent. when the average strength of the corps was only 694. Her Majesty's 84th, on the other hand, with an average strength of 1,100, lost in the year 1848 only 2·64 per cent. Again, the 2nd European light infantry in the year 1851 lost 6·27 per cent. of its average strength, which was 988, but in the following year, the strength remaining nearly the same (964), the regiment lost only five men, or 0·52 per cent. Her Majesty's 1st battalion, 1st Royals, arrived at Secunderabad in the beginning of 1858, about 1,200 strong. The regiment was composed for the greater part of young lads under 20 years of age, with but a few soldiers; it occupied the old infantry barracks, and it is calculated, allowing for men on duty, sick in hospital, and two companies stationed elsewhere, that the ten barrack rooms must have accommodated about 880 men. Deputy Inspector General Cole, in his report for 1858–9, calculates that at this rate each man must have had about 1,200 cubic feet of space. Still with this amount of space, the season being an unhealthy one, the regiment lost nearly 10 per cent. of its strength, chiefly from dysentery of a malignant type, and hepatic abscess. In an endeavour to account for the very marked difference in the rate of mortality in the Queen's regiments and in those of the East India Company, as shown by the foregoing table, something, it is believed, may fairly, and it is hoped without its appearing invidious, be ascribed to the fact that all the medical officers who have been in charge of the East India Company's regiments have been men of great experience in the treatment of Indian diseases, and selected on account of peculiar fitness for these particular charges, and likewise to the circumstance that every medical officer of the Madras service is required to undergo a probationary course of hospital attendance on first arriving in India, for the purpose of becoming acquainted with tropical diseases and those peculiar to the country. Whereas, in the other service, the medical officers have not these advantages, and it sometimes happens that the surgeons of newly arrived regiments who have never served in India, have all their experience of Indian diseases to gain, their men besides being equally unacquainted with the climate, until by dear-bought experience they learn to fall into the ways and habits of the country. The wing of Her Majesty's 12th Lancers, occupying the new barracks at Trimulgherry during the same period suffered severely, though in a less degree than the 1st Royals, from the epidemic. The average strength for the year was 310, and the deaths 25, of which number 21 resulted from dysentery and hepatic abscess, the deaths to strength being 8·06 per cent. The general idea amongst medical and military officers was, that the new barracks would be exempt from the epidemic visitations which have proved so destructive to life in the old locality, but the experience of the last year goes far to show that in certain malarious seasons, no matter where the troops are located, or how favourably they may be placed as regards sanitary requirements, dysentery and hepatic disease will always be fatal to the European soldier at Secunderabad. The new barracks are at present occupied by the 1st Royals and two batteries Royal Artillery, and the old infantry barracks after undergoing many alterations and improvements, are occupied by Her Majesty's 17th Lancers. It remains to be seen whether with the comparatively small body of men of a cavalry corps, the old will be inferior to the new buildings in a sanitary point of view. Compared with most other stations, Secunderabad cannot be considered a healthy residence for Europeans. For a period of 15 years, ending 1856–7, the death rate of the European portion of the Hyderabad Subsidiary Force, the greater portion of which is stationed at Secunderabad, was 34 per thousand, and for the last 10 years of this period, which were comparatively healthy, the deaths at the station of Secunderabad were at the rate of 24 per thousand, as shown in the preceding tables.
	Kamptee.	This station, distant about 10 miles from the capital of the Nagpore province, is occupied by the European and native troops of the Nagpore Subsidiary Force. The force consists of a troop of European Horse Artillery, a battery of foot artillery, an European infantry corps, one regiment of native cavalry, and three of native infantry. The peculiarities of the situation, in a sanitary point of view, are the great extremes of temperature which prevail in the hot and cold seasons. In the hot season, deaths from insolation, or heat asphyxia, are not infrequent amongst the Europeans. Cholera and small-pox epidemics occasionally visit the station. Remittent and intermittent fevers are common, especially after the setting in of the rains. These forms of fever are often obstinate, recurring periodically for years, and rarely leaving the patient while continuing to reside in the malarious locality. It has been observed of late years that these fevers have been more amenable to remedial measures, but this is probably the result of an improved method of treatment. It appears from the Medical Board's topographical description of the station, which will be found in the volumes herewith transmitted, that the death rate at Kamptee from 1829 to 1838 amongst Europeans was 39 per thousand. For the 15 years ending 1856–57, the mortality had somewhat diminished, the death rate being 37 per thousand, and for the last 10 years of this period, as shown in the table, it was only 29. European invalids at Kamptee labour under the great disadvantage of being cut off for many months of the year from the possibility of change to a sanitarium or healthier station. The geographical position which it occupies

STATIONS.	REPLIES.
Kamptee—*cont.*	makes a long and tedious land journey necessary to reach either coast, and in the wet or hot seasons it cannot be accomplished without considerable risk or injury to health. The Chiculda range of hills have been resorted to by European officers and their families during the hot months, and as they rise to an elevation of 3,800 feet, the change of temperature is found to be very agreeable, but it has not been practicable hitherto to send the invalids of the force thither. Another range of hills, the Muthoor, near Chindwarra, about 70 miles north-west of Kamptee, has now been visited and reported on by a committee of military and medical officers from the force, who were accompanied by a small party of soldiers, with a view to fixing upon a suitable site for a sanitarium. These hills are easily approached and appear to have a large extent of table land on their summit, supposed to be between 3,000 and 4,000 feet above the sea level. From all that we know at present concerning them they appear to be admirably suited for the Kamptee sanitarium.
MADRAS.	The European troops stationed at the Presidency town are located in barracks in Fort Saint George. There is accommodation for one regiment of European infantry, and about two companies of artillery belonging to the veteran battalion. Considerable improvements have been made of late years in the barracks, which are two-storied, and now furnished with verandahs all round. It is not very easy to account for the low position of Fort Saint George in the sanitary list. Situated close upon the sea, and enjoying the purifying influence of the sea breeze all the year round, the barracks in the fort ought to be a healthy residence for European troops. They have, however, been faulty in some respects. The lower story being on a level with the ground, and the fort wall and other buildings facing the sea keeping off the sea breeze from the lower rooms. It has been noticed by some of the medical officers of regiments occupying these barracks that a larger proportion of sick came from the companies inhabiting the lower rooms than from the upper story. The sea wall of the fort has lately been lowered, and the ventilation has been considerably improved thereby, even in the lower story. The medical officer of the regiment (43rd) thinks that the strong sea breeze now blowing through the buildings, causes an increase of pectoral disorders in the men. Sporadic cases of cholera occasionally occur in the fort, but the number of deaths from this cause have never been large. In the 10 years under notice, cholera prevailed during 4 of them, and in the year 1854, 9 men died from this disease. In the above period 19 deaths from cholera occurred out of a total of 226 cases treated. In the late severe epidemic of cholera which visited Madras, in 1860, the European troops in barracks almost entirely escaped, and there is no doubt that the improved buildings and the larger amount of space available has had a very satisfactory influence on the health of the corps at present stationed in Madras, viz., Her Majesty's 43rd Light Infantry.
WELLINGTON.	The next station was formerly known as Jackatalla (now called Wellington), on the Neilgherry hills, at an elevation of 5,840 feet above the sea. With reference to the low position of this station in the general list, it may be briefly explained that the period for which the average has been deduced was only three years, that the regiment which occupied the station, Her Majesty's 74th Highlanders, was indifferently housed on its first arrival, and that fevers and bowel complaints were very severe and fatal. The new barracks are now sufficiently complete to accommodate the 3rd battalion, Her Majesty's 60th Rifles, 1,200 strong, and this corps has been very healthy during the two years it has been stationed at Wellington. There is no doubt that further experience will show this station to be very well adapted for the location of European troops, and to preserve them in good health. One great advantage of the situation over all low country stations is the difficulty which the soldiers have of procuring deleterious liquor, or of indulging at all in intoxication. On this account, probably the hill station will not be a popular one with the men.
SAINT THOMAS' MOUNT.	The head-quarter station, Saint Thomas' Mount, of the Madras Artillery, situated 8 miles to the south of Fort Saint George, enjoys a similar climate and temperature to Madras. The heavier rate of mortality arises from the transfer of sick men from distant stations to the head-quarters for change of air or invaliding, and not from any preventible source of disease.
STATIONS IN BURMAH.	Rangoon, Tonghoo, Thyetmyo. } It will be observed that the Burmese stations show in the accompanying table the heaviest death rate of all. It must be explained that the averages were drawn for a period of five years, which included, moreover, the second Burmese war of 1852–3. At the period referred to none of these military stations existed, and on the first occupation of the Pegu provinces the troops, European and native, suffered very severely from dysentery and fevers. The stations now occupied by European troops have been getting healthier year by year, as the surrounding country has become cleared, and suitable accommodation provided for the men. For the last three years the death rate of Europeans in Burmah has not exceeded 17 per 1,000. There has been very little cholera amongst European troops since 1853. Dysentery and hepatic affections are the principal diseases, but these have diminished greatly of late years. Considering the great improvements which have taken place in the last three or four years, there is every reason to hope that the station in Burmah will be less injurious to the health of European troops than the majority of those in the Madras presidency. Native troops do not thrive well in Burmah, and measures are about to be taken to replace them, so far as possible, by police and local corps.
EXISTING SANITARIA IN THE MADRAS PRESIDENCY. 1. *Neilgherry Hills.*	1. Neilgherry Hills, including the Stations of Ootacamund, Coonoor, Kotagherry, and Wellington, the latter containing barrack accommodation for a regiment of 1,200 men, and a convalescent depôt. These sanitaria are so well known and appreciated that they need not be particularly described here. (*Vide* Topographical Report for southern division.)
2. *Ramandroog.*	2. A hill, distant 40 miles in a north-west direction from Bellary, elevation 3,400 feet above the sea. There is barrack and hospital accommodation here for 80 men. Invalids are sent here from Bellary and from Secunderabad, the latter station being about 200 miles distant. Cases of debility after bowel complaint, fevers, &c., usually do very well at this elevation. The locality is free from malaria.

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3. *Gallicondah.*	3. A hill region called Gallicondah, in the northern division, about 50 miles west of Vizagapatam, has recently been experimented upon as a sanitarium. The result of the first year's trial in a locality called Harris Valley was not satisfactory, but the failure probably may be attributed to the faulty nature of the situation and construction of the buildings erected for the accommodation of the trial party. It is intended during the approaching hot season to erect better buildings at a somewhat greater elevation, on a hill known as Grant's Range, and to give this a trial before deciding for or against the suitability of the Gallicondah range as a sanitarium. The presidency of Madras is particularly favoured in the number and extent of its hill ranges, suitable for the location of European troops or independent settlers. The chief of these hill ranges, with the peculiar advantages or disadvantages of each, will be here briefly noticed.
4. *Shevaroy Hills.*	4. This hill range is situated about five miles to the east of the town of Salem, and within the Salem collectorate or district; elevation 5,400 feet. They were originally explored in 1822, and visited by several European officers stationed in the adjoining low country; but some fatal cases of fever having occurred amongst the earlier visitors, they ceased to be resorted to by invalids. Of late years Europeans and East Indians have settled on the Shevaroys for the cultivation of coffee, and they, for the most part, enjoy good health. These hills are occasionally unhealthy during the months of May, June, and July; and on this account they have never been recommended as suitable for the location of European troops. The climate is, however, most delightful, and preferred by many persons to that of the Neilgherry Hills; and, railroad communication being now open to Salem, there is no doubt that the number of settlers and visitors will largely increase. Probably with increase of coffee cultivation on the hill slopes the periodical outbreaks of fever may be averted or diminished in severity, and this range may ultimately be found suitable for the location of troops.
5. *Pu'ney Hills.*	5. These hills are situated in the southern division of the presidency, between latitude 10° 10′ and 10° 44′, and longitude 76° 21′ and 77° 22′. Elevation of the higher plateaus about 7,000 feet. Climate very similar to that of the Neilgherries, but milder and less rainy in the south-west monsoon. The collector of the district and a few American missionaries have houses on these hills, and the climate is perfectly suitable for Europeans. At present very few, if any, European settlers have resorted to this range, although the soil and climate are considered to be favourable to the cultivation of tea and coffee. The nearest military station occupied by European troops is Trichinopoly, 80 miles distant.
6. *The Anamullays.*	6. The upper ranges of these hills, which attain an elevation equal to that of the Neilgherries, are entirely uninhabited. The temperature is much the same as that of Ootacamund, but the higher peaks being much exposed to the south-west monsoon, the rains are very heavy for six months of the year. In fact, it is doubtful whether the climate during these months would be at all suitable for the residence of Europeans. The lower ranges, from 3,000 to 4,000 feet above the sea, are visited by the forest department for a few months in each year in search of teak-wood, but they can only be occupied during the rains, being at other seasons very feverish to strangers. The natives of these hills, a race termed "khaders," curiously enough, never suffer from fever, unless they go to the low country. The higher ranges of these hills appear to be well adapted for the growth of tea and coffee; but the difficulty of approach and want of labour on the spot will prevent settlers from occupying them. With so many more favourable situations for European troops in the southern division, these hills will never be required for a sanitarium.
7. COORG.	7. *The mountain regions of Coory* are very well adapted for the residence of Europeans, but no European troops are now stationed in that country. Independent settlers are, however, becoming every year more numerous, and the cultivation of coffee is carried out on a large scale in various localities.
8. MYSORE.	8. *Mysore.*—Several hill ranges, varying in elevation from 4,000 to 5,000 feet, exist in this country, but it is doubtful whether any of these are so well adapted for European troops as the military station of Bangalore, the climate of which has already been noticed.
9. NAGPORE.	9. *The Muthoor range of Hills in Nagpore* appears to be well adapted for a sanitarium for the military station of Kamptee. Plans and estimates for the necessary buildings were lately submitted to the Supreme Government, but it is understood that the experiment cannot at present be proceeded with on account of the expense it would entail.
10. BURMAH.	10. *Burmah.*—It is reported that hill ranges exist in the Pegu provinces, and within reasonable distance of some of the stations occupied by European troops. These, however, have not as yet been sufficiently explored, to permit us to arrive at any conclusion as to their salubrity. The papers named below will give in detail most of the particulars required regarding the known hill ranges of this presidency.*
REMARKS ON PRINTED QUERIES—Clause 4.	Troops usually arrive from England between the months of July and December, or after the termination of the hot season. Recruits for the artillery and local European regiments are usually landed about 4 P.M., and marched off at once under escort of a European officer with a sufficient number of non-commissioned officers and men to keep them together, either to the artillery barracks at St. Thomas' Mount, distance 8 or 9 miles, or to the European depôt at the same place. Of late a depôt has been established at Arcot, distance 60 miles from Madras, to which place infantry recruits proceed by the railroad. Supper is provided for the men on arrival at the mount, cots, bedding, &c., being all prepared for their use under the usual barrack arrangements. The sick are conveyed either in doolies or sick carts to the artillery or depôt hospitals, and bad cases which cannot be moved to the mount or Arcot are at once admitted into the general hospital at Madras, within half a mile of the beach. Drafts of men for the British regiments are under similar arrangements marched to Poonamallee, distant 14 miles, to the depôt for that branch of the army.

* Proceedings of Government, dated 22nd November 1859, 15th March 1860, and 28th March 1861.—Report on Ramandroog Sanitarium, by Dr. Eyre.

STATIONS.	REPLIES.
Remarks on Printed Queries—*cont.*	Regiments on arriving, and intended to garrison Fort St. George, are at once marched into barracks on landing. As a general rule all European soldiers are restricted to barracks from a certain hour in the forenoon, usually from 8 A.M. till 4 P.M., this being a regimental arrangement which rests with commanding officers. The men are not allowed to go at large, and reading or coffee rooms, skittle alleys, &c., are attached to all European barracks for the amusement and recreation of the men. A staff of police peons accompanies detachments of troops marching to the depôts to keep off natives who would otherwise provide them with smuggled spirits, cigars, &c., and without some such arrangement, no doubt, the greater portion of the men would become intoxicated before reaching the end of the march. As it is only an occasional case of drunkenness occurs in those who escape the vigilance of the escort. There can be no doubt but much preventible disease arises from intemperance in European soldiers, the remedies for which undoubtedly are in the hands of the military authorities. They are chiefly the adoption of measures for preventing deleterious liquor being smuggled into barracks, providing wholesome spirits, malt liquor, &c., at the regimental canteens, restriction as to the quantity and encouraging men to habits of temperance by suitable rewards and advancement in the service, and lastly, by providing suitable amusements to lessen the tedium of a barrack life. Under ordinary circumstances, newly arrived drafts remain at the depôts until a sufficient number of men is collected to proceed to join a particular regiment or station; when no emergency exists, the batches of recruits, &c., leave the depôts between the end of October and the early part of the year according to distance. Proceeding from Madras towards Bangalore, and such stations as can be reached by that route, advantage is now taken of the railroad, open for about 120 miles westward of the Presidency. Since the year 1857, a system of moving troops by transit carts, instead of marching, has been adopted with the best results, many lives having no doubt been saved by escaping outbreaks of epidemic cholera, fevers, and other diseases incidental to long marches in India. These arrangements have been carried out between Madras, Bangalore, and the Neilgherries; also between Masulipatam, on the coast, and Secunderabad, and between Tranquebar, on the coast, and Trichinopoly. In other cases the reliefs between the several stations on the coast, such as Cannanore, Vizagapatam, Masulipatam, Madras, Tranquebar, &c., are carried out by means of steamers or transport ships. Recruits are always accompanied on the line of march by experienced non-commissioned officers and soldiers under one or more commissioned officers, and all possible precautions are adopted for preventing liquor being smuggled into camps. The hour of marching is usually about 3 A.M., so as to arrive at the new encamping ground about an hour or so after sunrise. Coffee is now always provided about half way on the line of march, and partaken of during a half hour's halt. Doolies and sick carts are provided for the carriage of the sick and foot-sore men, &c., in the proportion laid down in the quartermaster-general's regulations, and likewise tents in sufficient number according to strength, straw being allowed for the floors on which the men place their carpet or bedding.
Clause 5.	1st. It has long since been shown by Dr. Ballingall, professor of military surgery, University of Edinburgh, that seasoned soldiers are much less obnoxious to the injurious effects of a tropical climate than newly-arrived recruits, and all subsequent experience seems to establish the correctness of Dr. Ballingall's views and statements. Plethoric European young men arriving in India are not only more liable to fall into vices and habits in some measure incidental to their period of life, and contract syphilitic diseases, but suffer from the excitement occasioned by high temperature, without actual exposure, more than seasoned men. I should therefore say that from about 24 to 30 years of age is the best period of life for a soldier to land in India. 2nd. The amount of previous service before arriving in India should, under the view just stated, and supposing a recruit to be enlisted at the age of 18 years, not be less than six years. 3rd. In Southern India there is no doubt but the climate of Bangalore is the most suitable for newly-arrived Europeans. It is intermediate between the extreme heat of the plains and the cold of the hills (Neilgherries). Men become acclimatized and experienced in the many peculiar ways, and the mode of life in India, so different from previous habits. I would therefore prefer having a large depôt sufficient to accommodate the newly-arrived drafts of each year, established at Bangalore, than any other place or station I could name. The experiment of sending a newly-arrived regiment to Wellington on the Neilgherries proved a failure in one (the first) instance in which it was tried, the mortality from dysenteric complaints having been great, partly no doubt owing to suitable accommodation not being then available for the entire of the regiment. Every allowance being made for imperfect arrangements, I am still of opinion, that men passing the first year or two of service in the climate of Mysore would be more efficient for general service in whatever part of India they might be called on to serve, than if they had passed the same time in the Neilgherries or other hill stations. 4th. From the Mysore country the recruits or drafts may at the end of a year or two be sent to any other part of the Presidency where their services are required. As to the length of time a soldier should serve in India, instances are frequent of men being invalided as worn out at as early an age as 34 or 35 years, but many such have arrived in the country much under 20 years, some perhaps not more than 17 or 18; whereas had they arrived at the age of from 24 to 26 they would be in the prime of life and full vigour of manhood at ages when now often invalided as worn out and unfit for further effective service. Under a different system from that which has heretofore obtained, there is, I conceive, no reason to doubt but that most men arriving in India at the age, say, of 25, could serve with perfect efficiency from 12 to 15 years, and then return to their native land still effective soldiers. 5th. As regards the marriage of soldiers, I possess no information which would enable me to express an opinion on the subject.
Clause 6.	The general remarks above recorded as regards the protection of health on landing, transport to the interior, &c., will be found to contain nearly all that is requisite to be said on this subject. But there is one point not alluded to which I think of very great importance. It has been found that recruits joining the different European regiments of the local army very soon become acquainted with the ways and habits of the older soldiers, who, with the one exception of being unable to resist the temptation of drink, know well how to make themselves comfortable either in barracks or in the huts of the married soldiers, and to avoid the

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STATIONS.	REPLIES.
Remarks on Printed Queries—*cont.*	injurious effects of unnecessary exposure; whereas newly-arrived European regiments have everything to learn of themselves, and are all alike inexperienced regarding the effects of climate or Indian mode of life, from the colonel to the drum-boy. Medical officers have arrived in India in charge of regiments and drafts of soldiers during the late mutinies who were wholly unacquainted with the diseases of a tropical climate or those peculiar to India, and some had never previously seen a case of acute dysentery, hepatitis, or cholera. Still, though thus inexperienced, and having everything to learn, they were entrusted with the charge of hospitals full of all descriptions of Indian diseases, requiring for their proper management the experience of years. Fortunately the excellent staff of Madras medical subordinates was available in large numbers to do duty with these newly-arrived regiments, and the medical officers of Her Majesty's service have one and all borne ample testimony of the invaluable aid they received from the apothecaries and native dressers of the Madras army during the late field service in Bengal.
Clause 7.	*A List of Hospital Equipments.* 1 painted iron or wooden cot, with tape, and stone troughs. 1 palliasse of straw when marching or in the field. 2 quilts of gingham, both lined, one of them quilted with cotton—*clean once a week.* 1 blanket. 2 pillows. 1 bed-gown—*twice a week.* 1 pair of trousers, ditto. 1 cap of gingham, lined, ditto. 1 white cotton shirt—*every second morning.* 1 flannel banyan. 1 pair flannel drawers. 1 pair short worsted stockings or flannel socks. 1 flannel waist-band. 1 cap lined with flannel. 2 cotton shirts. Proportion of the above kept as stock for every 100 men. 60 shirts. 40 quilts. 30 gowns. 30 caps. 30 banyans. 30 pairs long drawers. 150 towels. 150 suttringees for each regiment of infantry. 100 ditto ditto dragoons.

Office of Principal Inspector-General, Medical Department,
Fort Saint George, 12th April 1861.

GEO. PEARSE, M.D.,
Principal Inspector-General,
Medical Department.

ADDENDA.

1.—MILITARY DEPARTMENT.—PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following Papers:—From the ADJUTANT-GENERAL of the ARMY, Fort Saint George, 1st November 1859, No. 1171, to the SECRETARY to GOVERNMENT, Military Department.

I have the honour, by order of the Commander-in-Chief, in forwarding for submission to the Honourable the Governor in Council, the accompanying extracts from Reports by the Inspector-General of Hospitals, on the Pulney, Neilgherry, and Annamullay Hills, with the remarks of the Director-General Medical Department appended thereto, to submit the following observations.

2. *Pulney Hills.*—The Commander-in-Chief quite concurs in the observations of the Director General, as per margin, and for other reasons also, his Excellency would not think of recommending that effect should be given to the suggestions of the Inspector-General, for the location of a European corps on the Pulney hills instead of at Trichinopoly.

States that the Pulneys are described as possessing an agreeable and bracing climate, well adapted to preserve the health and efficiency of European troops—that they are only healthy for about nine months of the year; during the remaining three months, viz., from April to June inclusive, decidedly unhealthy, and that he is unable to concur in the recommendation of the Inspector-General for the erection of the proposed barracks for a European regiment on the Pulneys instead of at Trichinopoly for various obvious medical reasons, and as it is not probable that Government would incur the double expense of providing barracks at Trichinopoly as well as the Pulneys, which must be the case if the latter are occupied for removal of the troops during the three unhealthy months, which embrace the hottest part of the year.

3. *Neilgherry Hills.*—As both the Director and Inspector-General see reason to object to the rule for assembling annual committees on sick officers on the Neilgherries, his Excellency thinks that paras. 9 and 10, G. O. G. No. 178, dated 10th August 1847, should be abrogated or modified.

4. *Jackatalla.*—The Commander-in-Chief quite agrees with the Director-General that regulations adapting the dress of the troops to the climate should be issued by officers commanding regiments stationed on the hills, that white jackets and trousers, except worn at mid-day, are unsuited to the climate, and that want of attention to this particular is a fruitful source of disease in persons newly arrived on the hills. His Excellency has accordingly caused a communication on this subject to be addressed to the officer commanding southern division.

5. *Annamullay Hills.*—So far as concerns military purposes, the Annamullay range is quite useless, while we have abundance of ground available on the Neilgherries, the salubrity of which has been proved by the test of experience.

EXTRACTS from a REPORT by the INSPECTOR-GENERAL of HOSPITALS, with REMARKS of the DIRECTOR-GENERAL annexed.

The Pulney Hills.

"The increasing interest taken by Government in all hill stations in India which are adapted as a residence for our English soldiers induced me, when on inspection duty at Madura, to visit the Pulney hills in company with Mr. Colebrook, the Zillah surgeon of the station, who has resided on them at intervals for many years past.

Series No. 2, dated 7th September 1858. Southern Division.

2. "It is now 22 years since Captain Ward of the Surveyor-General's Department first visited and reported on these lofty mountains. *Vide* 'Madras Literary Journal, Volume VI.

3. "Two years after the date of Captain Ward's visit, Dr. Wight, of the Madras Medical Department, reported

on their vegetable products. *Vide* 'Madras Literary Journal,' 1837.

4. "The Society for the Propagation of the Gospel established a mission on the table land of the Pulney hills ten years since, which they denominate 'Mount Zion.' In their Journal for 1851–2 there are a series of interesting letters descriptive of the country and its inhabitants, and of the silent, yet steady, introduction of Christianity amongst them.

5. Mr. T. Clarke, of the civil service, whose family resided on these hills for a long series of years, in his report to Government dated May 1853, treats on the same subject; and Captain Horsley, of the corps of Engineers, in August 1855, drew the attention of the chief engineer to the expediency of improving the communications between these hills and the plains.

6. In the following remarks I propose submitting the results of my personal inquiries, and also such particulars of interest as I have been able to glean of these elevated regions, as yet little frequented or known except to those who reside in their immediate neighbourhood.

7. "Thornton's Gazetteer" gives the latitude of the Vurragherry and Kunnundaven mountains, now commonly called Pulney, from their vicinity to the famous temple of that name, between 10° 10′ and 10° 44′, and the longitude 76° 21′ and 77° 22′.

8. They are distant from Trichinopoly, the head-quarters of the southern division of the army, about 80 miles, and about half that distance from the civil station of Madura. They lie west of Dindigul, south of Pulney, and north of Periacolum. According to Captain Ward, the elevation of the plateau land is 7,000 feet above the level of the surrounding plains, some of the peaks and ridges having a still higher elevation. The superficial area of the hills is calculated at 800 square miles; their length from east to west is 54 miles, and their medium breadth 15 miles.

9. *Passes.*—"The principal passes from the low country are—1st. On the north, from the village Pulney to Poombaray, a hill village to the west, and Veelputty, a hill village to the east. 2nd. On the west from the village Rutteambady to Maravanoor, a hill village to the west. 3rd. On the north-east from the village Periacolum to Kakakanal, a hill village to the west. 4th. On the south-east from the Davedunaputty to Palamalay and Sambanoor to the north-east. The slope by each of these passes seldom exceeds 1 in 12.

10. *Topography.*—"The hills are divided by the hill-people into two distinct portions, viz., the *Mel and Kel Malai*—the high and low, or eastern and western ranges.

11. "To the west, the table land reaches 7,000 feet, and gradually descends to the east, forming distinct plateaus at intervals of about 1,500 and 1,000 and 500 feet, until the plains are reached. The ranges are connected to the Travancore and south-west mountains by an isthmus about eight miles wide, being isolated on every other side. To the south the hills are excessively steep, presenting at their summit a magnificent wall of granite. To the north and east they slope downwards towards the low country in extensive broken ridges, and to the west the hills fall gradually and form at their base the valley of Ungeenad, from which the ground again rises abruptly to the south-west.

12. "The higher lands are free from wood and are covered with grass. The spurs which run down in every direction are intersected with deep ravines covered with dense luxuriant forest, resembling the sholas on the Neilgherries, and affording a greater variety of timber the nearer they approach the open country.

13. "In the heart of these mountains are situated rich and fertile valleys, which, intersected by numerous streams of various magnitude, picturesquely contrast with the bare and rugged heights which surround them, and in some spots present a view in the highest degree sublime."

Streams.—There are upwards of 30 large streams on these hills, which uniting form 11 respectable rivers. From the summits of the higher peaks overtaking the plains, these rivers are seen meandering through dense forests, down deep ravines, and over cultivated valleys, and finally pass down to irrigate the rich districts of Madura and Dindigul.

14. "The chief of these is the Nankosi river, which rises in the Puchamally hills, precipitates itself down to Kotalvilly, in a perpendicular cataract of 150 feet, into a deep basin worked by the force of the fall into the rock below."

15. *Villages.*—"The sites of the villages are generally selected with much taste. The houses are irregular clusters, built of mud and stone, and thatched. They have each a fire-place, and sheds for cattle are attached. The slopes in the vicinity of the villages are formed into terraces, on which are cultivated garlic, mustard, barley, wheat, and a grain similar to oats. As we descend rice fields gradually rise in a succession of terraces, irrigated from above by artificial canals.

16. Mr. T. Clarke, who from his long residence on the Pulney hills is the best authority we possess, states that they may be divided into seven grand divisions, being so many portions of their length and breadth, principally marked off by large and prominent ridges or by rivers running across the hills, as follows:—

1st. *Yettoor*, or the eight villages (sometimes called Manavanoor, from the largest of the eight), at the extreme west is of a parallelogram form. The river Ambravutty, after running a course of a few miles from its source to Munjaputty, where it receives the Tennar, forms the western boundary of these villages, and separates them on that side from Travancore and Coimbatore to the south, the zemindars of Bodmaikanoor and Vadagherry border their limits, and on the north the village of Poombaray with its hamlets intervene between them and Pulney, and on the east the same village divides Yettoor from Vilputty.

2nd. "Poombaray, bounded on the north by Balasamoodrum and the Rethumbody Zemindary, on the south by Yettoor and the Vadagherry Zemindary, on the east by Vilputty, and on the west by Travancore and Coimbatore.

3rd. "Vilputty, separated in the west from Poombaray by the high and marked ridge which forms the Tennavaray peak, and on the north from Cowanjee and other hill villages belonging to the Aycoody Zemindary, by the no less remarkable ridge which runs along the base of the highest point on these hills known as Perumal Malai. The ridge continues on the east side of Perumal Malai, and separates Vilputty from Tandygoody; on the south, Vilputty is bounded by the hill villages appertaining to the Vadagherry Zemindary, and the exterior ridge of the hills.

4th. "*Cowanjee*, embedded in high rocks, is bounded on the north and west by the villages of Balasamoodrum and Aycoody, on the east by Putchaloor and Tandygoody, and on the south by the village of Tandygoody.

5th. "The *Pareyoor Hills* are very extensive, covering an area of about 90 square miles, and are in the form of an isosceles triangle, decreasing to a point on the north side. They are bounded on the south by the Tandygoody hills, on the east by the Andaloor hills and by the Patchamaly range, on the north and west by the villages of Virupatchy on the plains and the villages of Cowanjee.

6th. "*Candimalai*, *Andaloor* and *Manaloor* hills form the eastern boundary of the hills, and are bounded on the north by Pulkanooth and Cunnivady; on the east by Durmattooputty and Ahtoor, on the south by Narasingapooram and Ayempolliem, and on the west by Tandygoody and Patchaloor."

7th. "The Tandygoody hills are bounded on the south by Davadunaputty; on the west by the river Ambavy and Permal Malai, on the north by Pereyoor, and on the east by Manaloor."

17. "Of these divisions, the 4th and 6th belong to the Zemindaries of Ayacoody and Cunnivady; and the 1st, 2nd, and 3rd form the upper range, and the 5th and the 7th the lower range of the hills."

18. *Inhabitants.*—"The inhabitants of these hills are supposed to number about 4,000 of both sexes. The villages have a mixed population. Some, who live by plunder, have a savage and ferocious look, but the majority are a mild and inoffensive people. They are divided into the following tribes:—*Paliars*, *Korravours* (or Mountaineers), *Asariers* and *Chetties*."

19. "There are also a few scattered families of a wild tribe of Polyars, who dwell in the woods, and subsist chiefly on honey, roots, &c. They live in caves or on flat forms erected on trees in the heart of forests. Their habits are very erratic, and they are shy of strangers."

1st. "The Paliars are supposed to be the aborigines of these mountains, and according to their traditions they date their possessions as far back as four or five centuries ago. They are a people perfectly distinct from those of the plains, in habits, feelings, and dialect, being free from many of their prejudices and superstitions."

2nd. "The Korravours profess to be the hereditary masters of the hills, but this is evidently a convenient tradition of their own, for there are other traditions extant, which show that they took possession in violation of the more ancient claims of the Paliars. To judge from appearance, they are a mixed race, descended probably from different castes, whose fathers emigrated from below. They are the chief landed proprietors, and hold the Paliars in a kind of

serfdom, exacting from them every menial species of labour, in return for which they permit them to cultivate land in the most sequestered parts of the mountains, grant them liberty to eat the flesh of dead animals, and to make use of such fruits and herbs as are found in the woods—notwithstanding their degraded position, the Paliars possess a considerable influence as priests and physicians. They alone understand the use of medicinal herbs, and the virtue of their incantations, as well as of their medicines, are highly extolled and deemed equally efficacious."

3rd. "The Asaries are the carpenters and blacksmiths of the hills."

4th. "The Chetties are the most recent emigrants from the plains. They deal in the principal products of the hills, lend money on exorbitant interest, and are in fact the capitalists. They are gradually acquiring the whole of the landed property of the mountains, and they keep up a close connection with the Chetties of the low country.

20. *Vegetable Products.*—"There is a vast extent of forest land in the valleys and glens, but a rapidly increasing cultivation, the effect of a proportionate increase of population, has led to the destruction of many valuable forest trees; some trees that still remain are of surpassing height, and conceal from view, by their dense foliage, the little villages which they surround.

21. "Lieutenant Beddome, assistant conservator of forests, who has lately explored those mountains, states that the grass on the plateau on the top is everywhere dotted with beautiful orchaedrous plants, and many others peculiar to a high altitude. The rhododendron, the lime, and the orange are indigenous, and there is an inexhaustible supply of gentiana and other medical plants.

22. "There is every probability that coffee will be extensively cultivated on these mountains, the luxuriance of the shrub and the flavour of the berry grown there, having attracted the attention of the late Madras exhibition.

23. *Wild Animals.*—"Elephants frequent the sholas. There are bison and elk in abundance. Bears are numerous, as are also the tiger and the cheetah. The mountaineers exhibit a great fondness for hunting, and they destroy the tiger by poison—when a tiger kills a bullock, a poisonous compound of roots and herbs mixed with sugar is rubbed into the fleshy part of the carcase—when the tiger returns to his prey, he eagerly devours this portion—the poison produces a powerful thirst, the first draught of water quickens its operation and kills him in a few hours. The death of the animal is then celebrated with public rejoicing.

24. *Climate and Seasons.*—"In referring to the important subject of climate, I can only speak of my personal experience during a limited stay on these hills in the end of the month of March. I had shortly before then made a similar short stay on the Neilgherries, (this being my first visit there also) when *en route* to Calicut; I was therefore well able to contrast the climate of both places. Although a month further advanced in the season at the date of my visit to the Pulneys, the temperature felt lower, the frost having just disappeared, and the air seemed even more exhilarating than it was at Ootacamund in the end of February. In the early part of the day, the wind blew steadily from the north-east, but towards the afternoon it veered round to the south, bringing up the sea breeze. The climate appeared to me quite equal to the Neilgherries, admirably adapted for the unimpaired European constitution and for the valetudinarian.

25. "Four circumstances naturally affect the climate of these hills.

First.—Their elevation.

Second.—Their isolated position.

Third.—Their situation between the east and west coast, the distance being about 60 and 80 miles respectively.

Fourth.—Their position near the line of demarcation of the two monsoons: on this subject, I am favoured by Mr. Magrath, director general of the medical department, with the following observations:—

"Over the peninsula of India, the winds make an *annual tour* as regular almost as clock-work. To commence, say from the eastern coast—they blow direct from the east about the end of February and beginning of March, then from south-east gradually going south, until by the middle of April they blow from south, veering round towards the west; these winds bring up moisture from over the Indian Ocean, and rain falls on the highlands of Ceylon, and extend usually over the southern part of the peninsula. Towards the end of May, the winds blow from the south-west and west, bringing up large banks of clouds towards the western coast, which in the end of that month and beginning of June, burst on the coast; the highlands of the ghauts receiving the great bulk of the fall.

"The rain falls heaviest at the western end of the Neilgherries, on the 'Koondas,' which are the highest parts of the line of ghauts, and in Coorg. On the coast it is lighter towards the south, increasing opposite the Neilgherry range to about 120 inches, which is the average fall at Calicut, and continues about the same up to Mangalore, opposite the higher parts of Coorg, where 180 inches fall, after which it decreases at Bombay; the fall of rain is not more than about 80 inches. It goes on decreasing as it passes into Guzerat, until it is lost altogether, there being no monsoon in Sinde. The rain passes inland from the western coast over the Mysore and the Deccan, and goes northward and eastward. In September and beginning of October, the winds veer round to north and north-east, and then occurs our north-east monsoon with its accompanying rains.

"The south-west monsoon sets in and prevails in Pegu at the same time as on the western coast, and the fall of rain diminishes as it goes inland north and east, just as it does on this peninsula.

26. "It will appear from this, that the Neilgherries on their western side receive very heavy rain, and which extends very much to Ootacamund, whereas the hills to the south-east of the Neilgherries, such as the Pulneys, which are so much more inland, receive a lighter fall at the same time that they share in the earlier rains of April, and again in the latter rains of the north-east monsoon, thereby giving them more the character of the climate of Kandy and Newera Ellia, and a greater freshness throughout the year, and in a measure a freedom from the aridity which prevails on the Neilgherries for three or four months."

27. "I extract the following remarks regarding the seasons from the 'Missionary Journal,' above referred to:—'The coldest season is from October to January. The thermometer then ranges from 35° to 65° at mid-day. The weather continues cold to the end of February, during which time there are thick fogs and occasionally heavy falls of rain. April, May, and June are dry months with heavy night dews. The thermometer during the day rises as high as 80° degrees, and the sun's rays are powerful. From the middle of June the climate is delightful. The occasional showers which fall, replenish the streams and give life and vigour to everything around."

28. "Mr. T. Clarke, an excellent authority on these matters from his long residence on the hills, observes:—

"The year is divided into two seasons, the cold season similar to the autumn of the south of France, may be said to set in from December and terminate in March, whilst the monsoon season, resembling a mild autumn in the south of England, occupies the remaining months.

"With reference to the climate of the higher hills in particular, the following, as far as I am able to learn, may be considered a pretty fair estimate.

"January is uniformly fair, clear, and dry. The nights are very cold, and attended with frost in the valleys. The same remarks will apply to February, except that frost is stronger, and in March it disappears, when the weather becomes milder, and there are a few heavy showers. Towards the close of April, the wind begins to vary from north-east, and finally settles in the south-west, when the air becomes mild and balmy. May is the warmest month, but the heat is often relieved by the fall of rain in torrents, intermingled with hail, ushering in the south-west monsoon, which occurs in the early part of June, and continues with greater or less constancy through July and August, when the weather on the lower hills is comparatively dry and fine. September and October are uncertain months, depending on the state of the south-west monsoon, which if begun early and exhausted, renders the weather fine, warm and pleasant, but if deficient in previous rain, a good deal of mist and drizzle generally prevails. Towards the end of September, the wind again begins to shift round to the north, when the weather becomes suddenly colder, mists and fogs are common throughout the year; some gales of wind occur once or twice a year, generally about the changes of season, but thunder and storms are of rare occurrence. The changes of temperature are sudden.

"On the lower ranges, the village of Tandygoody is situated about 18 miles distant from Vilputty, and about 26 from Poombaray on the eastward. It is about 5,600 feet above the level of the sea. The climate is here much milder than on the upper plateau. The air is moister and the nights less cold. In June, July, and August, the weather is clear, bright and fair, while on the upper hills there is much drizzle or rain. This difference arises from the former place being less subject to the influence of the

south-west monsoon. Less rain falls at this place, and it is often dry here when it rains to the west.

"The Virupatchy villages are situated on a plateau between Tandygoody and the plains. Its elevation varies; the higher villages being from about 5,000 to 2,500 feet above the sea; its temperature is higher than on the west range and Tandygoody."

29. *Geological formation.*—The rocks on the hills are gneiss, over which is generally found a stratum of clay, white and yellow of different tints, the whole covered with a coat of vegetable mould. On the tops and slopes of the hills the soil is seldom found more than a foot or two in thickness, but in the valleys it sinks to a greater depth, and towards the rivers and creeks a rich alluvial soil is found, containing a large portion of silicious sand, mixed with mica. In some parts a ferruginous and calcareous kunker prevails, but the former predominates. Both are in some places on the surface, whilst in others some feet below the black earth.

30. The whole of the elevated lands of the west division is uncultivated. In the valleys, near the villages, cultivation is more extended,—here the red soil is intersected by rivulets and rivers, and in some places by large morasses. The eastern parts are more productive than the western, having a considerably large portion of fine rich loam, and being less exposed.

31. *Salubrity.*—The higher ranges are decidedly salubrious, and the inhabitants are a robust and healthy people. The most unhealthy seasons with them are the cold months, when coughs and colds and occasional fever from exposure are met with. Small-pox of a fatal character has of late carried off many of the natives—with Europeans there is a predisposition to catarrhal affections from April to June. In the lower ranges to the east, from March to July, it is decidedly unhealthy; the inhabitants there suffer much from fevers, enlargement of the spleen being also common.

32. But it were difficult to find a climate more congenial to the feelings, more calculated to preserve health, or to restore the invalid, than this elevated area affords—I believe it calculated to promote recovery in all, save the exceptional cases of diseases of the heart and some affections of the lungs, where the stimulus of the rarefied atmosphere would be injurious.

33. Already, at a place called Kadakarnal, some of the civilians of the district of Madura have built houses, to which their families resort. But these hills deserve to be more frequented by Europeans, who, with their superior knowledge, would speedily introduce comforts, and preserve their constitutions against the diseases incidental to a prolonged residence on the plains.

34. With telegraphs to the summits of our mountains and railways, or even good transit communications to their base, many of our healthy European corps might be located on them; rather with the view to maintain health than to renovate it—and still be as available for duty as if they occupied the posts they do now.

35. It is in contemplation to build barracks for our European soldiers at Trichinopoly; I trust before this step be decided on, the advantages of placing them on this attractive region may be considered. The additional expense incurred would be fully counterbalanced by the favourable results which might be confidently anticipated.

Remarks by the Director-General.

The foregoing report gives a highly interesting account of the Pulney hills, although it does not contain much that is new, or that has not already been known and in part published in the "Madras Literary Journal." *Vide* No. VI.

The Pulneys are described as possessing an agreeable and bracing climate, well adapted to preserve the health and efficiency of European troops. They are, however, only healthy, as far as is known of the parts inhabited, for about nine months of the year. During the remaining three months, *i.e.*, from April to June, both inclusive, they are decidedly unhealthy, and the natives of the lower ranges, (for it does not appear from the report that the higher parts said to reach an elevation of 7,000 feet have any native inhabitants) suffer much from fever and disease of the spleen.

The Inspector-General, notwithstanding, recommends that instead of the proposed barracks for a European regiment to be built at Trichinopoly, barracks should be erected on the Pulney hills.

In this recommendation I am unable to concur, for the following obvious reasons:—

To station a regiment on the Pulneys during the sickly season it is evident would be to destroy its efficiency. For it is a well-established fact that Europeans, or even natives of the low country, suffer more severely from malarious diseases than the acclimated denizens of the mountain ranges and ghauts of Southern India. There is, it may further be remarked, no form of Indian disease of a more obstinate character, or one that undermines the constitution so much, or is so difficult to eradicate, as malarious hill fever. It seems to me, therefore, that unless barrack accommodation should be available at Trichinopoly or elsewhere, to which the troops could be removed for the three unhealthy months, which embrace the hottest part of the year, that it would be setting at defiance all previous experience and knowledge of these hill regions, to select the Pulneys as a site for the new barracks.

As it is not probable that Government would incur the double expense of providing barracks at Trichinopoly as well as on the hills, I do not see how the Inspector-General's proposal can be carried out. This is, however, the less to be regretted, as table land at a higher elevation, and in localities known to be healthy, is available on the Neilgherries to any extent required, should it be found necessary at any time to provide more accommodation for European troops on the hills of Southern India.

EXTRACT from a REPORT by the INSPECTOR-GENERAL of HOSPITALS, with REMARKS of the DIRECTOR-GENERAL annexed.

NEILGHERRY HILLS.

Series No. 3, dated 4th October 1858.

29. "For some years past it has been the practice to hold annual committees on public servants under the Madras Government, who happen to be resident on the hills for a period of upwards of 12 months, with the view to ordering them back to their duties, if sufficiently recovered.

30. "This rule does not affect public servants of the other presidencies resident on the hills on medical certificate, nor does it bear on officers proceeding to England or elsewhere than the hills on sick leave. The latter enjoy full advantage of the leave originally recommended for them by the medical officer who attended on them during the illness which made it necessary for them to proceed on leave, and which a medical board on the spot confirmed. Unless there be some good reason why this rule should not be done away with, I am of opinion it should be abolished; it appears to me to operate injuriously, both to the patient and the public service."

Remarks by the Director-General.

I perfectly agree with the Inspector-General in his remarks, that annual committees on sick officers on the Neilgherries are unnecessary. It is, I know, considered a hardship by sick officers to be obliged to appear before such committees, and I am not aware of any benefit resulting from them, except that one or two invalid officers who had taken up their residence on the hills for years were obliged either to proceed to Europe or join their regiments.

It was the opinion of a medical officer of great experience, Dr. Birch, formerly resident at Ootacamund, that many patients did not begin to derive permanent benefit from the climate of the hills until they had been about a year resident on them, and he recommended his patients always to remain a second year before returning to the low country.

Jackatalla Barracks.

39. "The strictest attention is now required to sanitary matters, while so many people are at work on the buildings, for there is some danger of the place becoming so polluted as to establish a malarious atmospheric taint which may hereafter become an incidental source of disease. Indeed the effects of this neglected conservancy has already begun to exhibit a noxious influence on parties residing there.

40. "The great difficulty at Jackatalla is, the removal of the sewage from the barracks, &c.; four plans have been proposed.

1st. "The formation of one or more lakes in the ravine and valley through which the Coonoor river flows, into which the night soil conveyed by pipes would pass."

2nd. "The removal of the night soil (deodorized by peat charcoal) by means of carts to a distance from the barracks.

3rd. "The removal of the sewage by means of pipes into the Coonoor river, from whence it would be carried onwards by the streams.

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4th. "The removal of the sewage by pipes into the ravine but not into the stream, and from thence on by a closed main conduit to a point beyond the station of Coonoor, a distance of two miles, there to discharge its contents into a cascade. The river from this point flows by a steep decline down the ghaut through an uninhabited country, a distance of 12 miles, receiving in its course several tributaries, and finally empties itself into the Bowanee."

41. "To adopt the first plan would be merely to create endemic sources of disease, for the proposed lakes would speedily become cesspools."

42. "The difficulty of removing the night-soil by carts to a sufficient distance, and the dangers of impregnating another position by impure exhalations, are sufficient reasons for not putting the second plan into force."

43. "The third plan would pollute the pure mountain stream, which alone affords a water supply to hundreds of followers in the bazaar of Jackatalla, and to the inhabitants of Coonoor. This plan has been already sanctioned, and to a certain extent carried out."

44. "The fourth of the above plans is without doubt the only perfect system to adopt, consistent with sanitary considerations. By it the night-soil will be received into a closed main conduit by a system of intercepting pipes from the barracks, hospital, sanitarium, depôt, married men's and officers' quarters, and will be forced by the pressure of water from above through a long culvert, to a point beyond the reach of doing injury by contaminating the stream or the atmosphere." *Vide* Minutes of Consultation, No. 1,431, dated 23rd July 1858.

45. "Nothing can be more noxious or offensive than the present system. There have been nearly 3,000 people at work daily at Jackatalla for many months past. There is no permanent officer in command or commissariat officer. There have been no fewer than 15 since May 1854, so that there has been no local responsible supervision; the consequence is that the cantonment and neighbourhood is tainted with a fœcal atmosphere. Go where you will, in the unfinished buildings, in court yards—even in the very rooms, human ordure is found. Already the result of this neglected conservancy is exhibited in low fevers in European children and grown-up people. The coercive interference of Government is therefore required to preserve the character of the station for salubrity."

53. "Some of the convalescents now there, are dressed in their white jackets and trousers, others in their regimentals. I think it would be attended with advantage if a supply of clothing suitable to the climate, such as the ordinary shepherds' plaid or some other pattern of Scotch tweed were at all times kept in store and issued to the men on arrival at this station."

74—3rd. "That latrines be dug to which the natives should be forced to resort, peat charcoal and earth to be thrown into these two or three times a week.

4th. "That immediate measures be adopted for clearing out the privy for Europeans, and,

5th. "Finally, as all these measures are but make-shifts until the great plan for the removal of the sewage by pipes is carried out, that the executive engineer be instructed to procure immediately from England the length of piping already sanctioned, and in the meantime proceed with the construction of the channels so that the piping can be laid down on arrival."

47. "There are other two measures which I would earnestly urge for the consideration of the Director-General, with the view to the hygiene of the station.

First. "The enclosure of the extensive ravine situated to the southward of the barracks, and lying between the barrack hill and that selected for the convalescent depôt (which is at present the most offensive spot in cantonment) with the view to its conversion into a soldiers' orchard and vegetable garden. Captain Campbell the engineer in charge, who takes the warmest interest in the improvement of this important sanitarium, and who has already accomplished so much in the formation of a forest in the neighbourhood, informs me that if vested with authority and furnished with a small monthly sum to expend on the place, from 150 to 170 rupees per mensem for twelve months, he will undertake to convert this piece of waste land into an orchard and garden intersected with paths and fountains.

Second. "That the bazaar now in course of formation contiguous to the barracks should be erected on a distinct plan, with houses as much as possible of an uniform pattern, and with streets so formed as to permit of free ventilation and drainage, in order that we avoid the usual teeming sources of disease, which so closely and fatally encircle our wretched Indian bazaars. The space allotted for the bazaars is too circumscribed; but it is capable of being extended on a piece of waste land situated to the west of its present site."

48. "In the centre of the barrack square two rows of trees with a path between and a fountain in the centre, would induce the soldiers to leave their barracks and take exercise under their shade, where seats would be placed.

49. "In conclusion, I would submit that all sanitary arrangements be vested in the resident engineer, in counsel with the resident medical officer so long as the station is under construction and public works going on; giving the former the means and holding him responsible for the efficient conservancy of the cantonment, and giving him also control over the roads, watercourses, and channels."

Remarks by the Director-General.

The suggestions of the Inspector-General and of the engineer officer for the improvement of the station, and purifying the offensive places of resort for natives, are considered deserving of the consideration of Government.

The plan for carrying off the sewage, para. 44, is well suited to preserve the cleanliness and salubrity of the cantonment.

Regulations regarding the dress of the troops being adapted to the climate, should be issued by officers commanding regiments stationed on the hills. White jackets and trousers (except worn at mid-day) being unsuited to the climate, want of attention to this particular is a fruitful source of disease in persons newly arrived on the hills.

EXTRACT from a REPORT by the INSPECTOR-GENERAL of HOSPITALS, with REMARKS of the DIRECTOR-GENERAL annexed.

ANNAMULLAY HILLS.

Series No. 4, *dated 9th October* 1858.—Para. 1. "The eastern Ghauts are intersected by several deep valleys, but in only one place are they completely divided. This opening is shaped like a funnel with its narrowest end towards the east, and is almost in a direct line between Trichinopoly and the Travancore country. So soon as the west winds begin to prevail on the coast, a free and full passage is thus granted into the province of Coimbatore, where it exercises a very beneficial influence."

Paulghautcherry.—2. "Until lately a regiment of native infantry and a detachment of artillery garrisoned the Paulghaut pass; now it forms the head-quarters of a sub-collectorate, and the fort, which is placed on a somewhat elevated ridge in the centre of the pass, is occupied by a detachment of native infantry under an European officer."

4. "The hills on each side of this pass present a rugged and bold outline. Running nearly parallel with the sea, is the Annamullay range; and the general direction of the higher ranges, viz., the southern side of the triangle of the Neilgherries and the Annamullays is nearly from west to east, while that of the more important smaller ranges is from north to south; still smaller spurs and partly detached branches run off from these in every direction, and their occasional confused and clustered masses have, from a distance, an exceedingly picturesque appearance."

5. "The sides of these hills are usually covered with jungle, but this is fast disappearing, as is also the belt of wood which formerly extended round their base, in many places from five to ten miles broad, the ground on which it stood having been let to the cultivator for a long period of years on favourable terms."

6. "In many places, although every tree and shrub which formed this dense forest has been removed, the ground still remains a barren waste, and I quite concur in the opinion of Doctor Cleghorn, the conservator of forests (who accompanied me on this tour) that this indiscriminate removal of the trees has already exercised a prejudical effect on the climate of the locality; the soil having now lost the benefit of the moisture which their foliage attracted, and the evaporation which it checked."

7. "On the Annamullay range of hills about twenty miles from the Paulghaut pass, and five or six from the plains, at an elevation of about 3,000 feet above the level of the sea, Lieutenant Beddome, the assistant conservator of forests, has fixed his head quarters. The ascent to this place is through a straggling forest of teak, blackwood, and other jungle trees, many of which are of very large dimen-

sions. The timber on being cleaned or cut into planks, is carted or dragged by elephants to the base of the hill, from whence it is either removed for Government purposes, or sold by auction to the public."

8. "Fever of a very severe character is usually present at the base of the mountain, but at Soonocuddoo and in the forest it is less prevalent. The working season extends from July to January; during the remaining six dry months of the year the forest is altogether abandoned; the fatal character of the fever which then appears in all its intensity, rendering this course necessary."

9. "Fever of a milder type prevails at all seasons, and some valuable lives have already been lost. The strength of the party who work under Lieutenant Beddome, averages with axe-men, elephant attendants, &c., from 400 to 500, among whom are three European overseers and some Indo-Britons."

14. "The forest department only occupies the western and lower portions of the Annamullay mountains. The more lofty, or as these are usually denominated the Delhi range, have hitherto been unexplored. An unsuccessful attempt was made in 1850, by Captain Michael, of the 39th regiment native infantry, to reach the summit, and he arrived at an elevation of 7,000 feet above the sea. In his report he adverted to a valley of some extent about that altitude, and of still higher ranges which he was unable to arrive at, which appeared to rise twelve or fifteen hundred feet beyond this. Considering it a matter of interest as well as of importance to ascertain the extent of this valley, and the capabilities of the hills generally, as a place of residence for Europeans, in company with assistant surgeon Cleghorn, Cornish, and some other friends we commenced the ascent on the 15th September."

15. "We selected this period, as there appeared to be a favourable break in the weather between the passing away of the south-west and the advent of the north-east monsoon."

16. "The night before our ascent we slept at Kotoor, a village six miles from the foot of the hills; to have encamped closer would have been dangerous, fever being always present at the base of these mountains. We reached the Annamullay river at daylight, and crossed it in boats. This is a rapid stream 30 to 40 yards wide, formed by the confluence of the Toracuddoo, Ponachee, and other mountain torrents. About a mile from the river we arrived at the foot of the ghaut leading to the village of Ponachee, passing on the road elephant pits and tiger traps long in disuse. This pass which is a mile in length is too steep and rocky for horses to ascend, so we sent them back to the plains, performing the rest of the journey on foot. Four miles further on we came to the village of Ponachee, containing 15 houses. This spot was ascertained to be 3,000 feet above the level of the sea. Descending from this village, we arrived at the Toracuddoo river, which at this spot is a broad rapid stream three to four feet in depth, and to judge from the water marks on the trees, its depth must at times exceed six feet."

17. "Following up the course of this stream, and about ten miles south from the village of Ponachee, we reached a succession of cascades and a waterfall of considerable magnitude near the foot of two remarkable conical peaks of bare rock which are observed from a great distance in the plains, called the "Ukkah and Thungachy Mullay," or the elder and younger sisters."

18. "The height here proved to be 3,500 feet, the ascent from Ponachee being very gradual. Our course up to this point was south-west, and led through a thin forest of teak and other jungle trees, a good deal of bamboo and open glades with grass five to six feet high. To judge from the appearance of the banks of the Toracuddoo river after it passes Ponachee, it is not improbable that a much easier pass into the hills might be made from the plains by following this stream, thus avoiding the precipitous ascent by which we reached the village, and shortening the distance fully one half."

19. "From the waterfall the ascent was sudden, in many places over steep rocks and through dense sholas; still up the course of the Toracuddoo river, until we arrived at a beautiful undulating valley between the Ukkah and Thungachy Mullay and Payratmullay. In extent this valley is nearly equal to that of Ootacamund, and it varies in elevation from 6,000 to 6,800 feet above the sea."

20. "The general appearance and character of these high lands resemble very much that found on the Neilgherries. Here are the same rounded eminences and dense sholas extending continuously for miles, their edges ceasing abruptly. Conical hills and slopes covered with short rich grass abounding with medicinal plants, such as Ophelia elegans (gentian) and Hymenodyction excelsium (a species of cinchona) and vegetation precisely similar to that found there.

21. "The heavy rain which fell continuously during the period of our stay on these upper regions, evidently the breaking up of the south-west monsoon, the want of shelter, for there are no inhabitants in the higher altitudes, and the difficulty of procuring supplies from the low country, put it out of our power to proceed to the more lofty parts of the range, which is apparently about 12 miles off in a south-eastern direction, from the extreme point we reached, where, from the large streams of water which still descended to the north in cascades and water-falls to form the Toracuddoo river, and the occasional glimpses which we had through the mist, I have little doubt that similar valleys or table land would be found. We, therefore, reluctantly returned to the low country without attaining our object, having been absent eight days.

22. "The best period to prosecute inquiry into the upper ranges of the Annamullay mountains would be after October, or in the hot season. From their position, they are necessarily considerably under the influence of the south-west monsoon, but less so than the Koondahs at Sespoora, and I think it is worthy of inquiry to ascertain whether here also may not be found a climate as bracing and welcome to the enervated constitution of the European invalid as is found to exist on our better-known hill stations.

23. "Three distinct tribes inhabit the Annamullay hills. They are denominated—

Kadars,
Poliars, and
Mulcers.

"The Kadars will perform no menial labour; as their name implies, they are the lords of the hills. They will carry a gun, and are expert at stalking game, but they are deeply offended if they are called coolies. They are a truthful, trustworthy, and obliging tribe, and exercise some influence over the Poliars and Mulcers. Small in stature, their features resemble the African, and they have his curly hair tied by a knot behind, and they file the four front teeth of the upper jaw to a point as a marriage ceremony.

24. "The Poliars are chiefly herdsmen and mechanics, while the Mulcers are cultivators of the soil. None of these tribes reside at a higher elevation than 4,000 to 5,000 feet above the sea.

25. "All deal in the rich produce of these hills, and barter with the people in the plains their cardamums, turmeric, ginger, honey, wax, rosins, millets, soapnuts, gallnuts, &c., &c., for rice, tobacco, &c.

26. "They are very expert in climbing trees and the precipitous face of rocks in search of honey. To accomplish the former, where there are no boughs, they drive short bamboo spikes into the tree, and thus form a ladder, by means of which they ascend the highest forest trees; and they reach the latter by means of chains formed by rings made with rattan, which, being secured to a point above, drops down the face of the rock. We observed some of these chains full 50 and 60 feet in length.

27. "The upper ranges are in undisturbed possession of wild beasts. We saw a herd of bison, elk, and ibex in numbers, and also tracts of wild elephants. The latter I encountered in the lower plateaus towards Poonacuddoor.

28. "I have now completed my report on the chief mountains under this presidency, all of which I have personally inspected. The importance of the subjects treated must be my apology for having dwelt so long on them.

29. "It is evident that the European race must henceforth be dominant in this country. Now that the old confidence between them and the native troops is in some measure destroyed, we can no longer rely upon the latter as our principal defence. The drain upon the youth and vigour of England to support an army which will hold a population of 18,000,000 in subjection by the force of arms alone, would speedily impair our national strength.

30. "I firmly believe that on the mountain regions which I have described, independent of a location of our soldiers there, the establishment of small communities of Englishmen would be attended with the happiest results upon the native mind. It would add at once to our military strength, and, in course of time, it would give us the means, to a certain extent, of recruiting our army."

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The following TABLE exhibits as correctly as I have been able to ascertain, the mean temperature of each month, the height and the average fall of rain on the several mountains and hill stations already occupied or brought to notice in India.

	Names of Hills or Hill Stations.	Mean Temperature in January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Ascertained Height.	Average fall of Rain per Annum in Inches.	Remarks.
Bengal Presidency.	Darjeeling	40	41	51	55	61	62	63	64	63	55	50	44	8,008	125¼	
	Simla	40	44	53	61	66	80	75	78	70	67	52	46	8,000	70	
	Landour	35	40	51	0	0	0	0	68	64	49	46	46	7,300	0	
	Murree	0	0	0	0	0	69	68	66	62	62	0	0	6,786	0	
	Kussowlie	42	47	58	64	77	73	70	70	72	66	0	0	6,400	70	
	Naynee Tal	42	46	56	61	69	69	67	69	65	61	50	47	6,200	82½	* Situated in the Southern Division.
	Dugshai	42	47	57	64	69	71	72	68	66	62	54	53	6,000	70	
	Subathoo	0	0	0	77	81	84	79	77	0	0	0	0	4,000	70	
Madras Presidency.	*Ootacamund	54	56	60	61	61	57	63	63	63	56	54	53	7,361	60	† Situated in the Southern Division.
	*Kotagherry	59	60	61	63	63	64	65	65	64	62	60	59	6,100	55	
	*Jackatalla	59	61	67	68	68	64	70	70	70	63	61	60	5,840	50	
	*Coonoor	60	62	68	68	68	65	70	70	70	65	62	62	5,761	50	‡ Situated in Centre Division.
	*Pulneys	51	53	60	61	Averages 25° under that of the plains.								7,000	0	§ Situated in Ceded Districts.
	†Annamullays	0	0	0	0	0	0	0	0	66	56	0	0	6,800	0	
	‡Shevaroys	65	65	68	71	71	68	68	68	67	66	66	65	5,260	40	‖ Situated between Secunderabad and Nagpore.
	§Ramandroog	70	76	80	80	75	73	71	70	70	71	71	67	3,400	46	
	‖Chiculdah	60	60	70	83	83	71	0	0	0	0	71	71	3,600	0	These hills are not occupied during the rains. There is, therefore, no record of the fall of rain.
Bombay Presidency.	Mahableshwur	63	65	72	74	72	67	63	64	64	66	64	63	4,700	239¾	
	Poorendhur	67	73	77	78	73	70	67	65	67	71	69	64	4,200	72¼	
	Matheran	0	Temperature throughout the year about 10° under that of Bombay.											2,500	0	
	Mount Aboo	61	61	69	77	77	77	69	69	69	69	69	61	4,015	78¼	

Remarks by the Director-General.

The report on the Annamullay hills is forwarded to the Commander-in-Chief and Government, as forming a part of the general account of the hill ranges of Southern India, which have been visited by the Inspector-General of Hospitals.

There is but little to notice in this paper which can be turned to a practical or profitable account, considering the imperfect knowledge of the more lofty and as yet almost unknown parts of the range.

These hills are surrounded by an extent of forest, at all times feverish; but for six months of the year, including the dry season, so very unhealthy as to be deserted by the conservator of forests and his establishment, on account of the deadly nature of the fever which prevails at such season.

The Annamullay range, it is stated, rises to an elevation at some points of more than 7,000 feet, and the late conservator of forests, Captain Michael, reported that a valley of some extent existed at an elevation of nearly 7,000 feet above the sea level, with still higher ranges in the distance, which he was unable to reach. These ranges the Inspector-General and his party also failed to ascend in an attempt made in September 1858, owing to heavy rains setting in, the want of shelter, and difficulty of obtaining supplies.

As remarked on another occasion, the extent of land available on the Neilgherry hills, either for settlers or for locating troops, their easiness of access, and well-known salubrity, render this failure, except as a matter of general and geographical interest, a cause of no great regret.

A very interesting table is annexed to this report, showing the elevation and temperature of the principal hill stations throughout India, with the average fall of rain, compiled with much labour and research.

ORDER, No. 4,149, *22nd November* 1859.

* *On the Pulney, Neilgherry, and Annamullay Hills.*

The Governor in Council has perused with much interest the reports* submitted with the foregoing letter, which are highly creditable to Dr. Macpherson's professional zeal and energy.

† *Mins. of Cons. Military Department, No.* 1,266. *dated 4th April* 1859. *Mins. of Cons. Public Works Department, No.* 893, *dated 15th, and No.* 923, *dated 19th April* 1859.

2. The Governor in Council observes that orders† have already been passed by Government on the principal points remarked upon by the Inspector-General of Hospitals with reference to Jackatalla, through the Quartermaster-General of the Army, to whose department the general subject of these reports appears more properly to belong.

3. With reference, however, to the particular points brought to notice in the Adjutant-General's letter, the Governor in Council proceeds to pass the following orders:—

1st. His Excellency the Commander-in-Chief, the Director-General and the Inspector-General of the Medical Department, are unanimous in recommending the abolition of the annual medical committees on the Neilgherries, which are pronounced by competent medical authority "to operate "prejudicially both to the patients and the public service." The Governor in Council accordingly directs that paras. 9 and 10 of G. O. G. No. 178, of 1847, be cancelled, corresponding alterations being made in the general regulations,‡ and notified in G. O. by the Commander-in-Chief.

‡ *Paras.* 11 *and* 12, *Part II., Section XVIII.*

2d. The subject of clothing adverted to in para. 58 of the Report, as worn by convalescents at the depôt on the hills, appears to have met the attention of the Commander-in-Chief, with whom its disposal properly rests.

4. The foregoing correspondence will be forwarded to the Government of India for transmission to the Right Honourable the Secretary of State for India, with reference to Despatch No. 73, dated 15th December 1858, accompanying letter No. 1,429, of the 24th January 1859, from that Government.

(True extract.)
(Signed) H. MARSHALL, Colonel,
Acting Deputy Secretary to Government.

To the Adjutant-General.
" Director-General, Medical Department.
" Quartermaster-General.
Exd. J. DAVIS.

2.—PUBLIC DEPARTMENT.—PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letter from Major DOUGLAS HAMILTON, late on special duty Military Hill Ranges, to T. PYCROFT, Esq., Chief Secretary to Government, Fort St. George, dated Negapatam, 1st March 1860.

1. Having joined my regiment proceeding on service to China, I have the honour, agreeably to instructions received from His Excellency Sir Charles Trevelyan, to report the progress I have made in carrying out the special duty to which I was appointed.

2. I proceeded from Trichinopoly to the Pulney mountains, which I reached on the 9th of October. Soon after my arrival the north-east monsoon set in with unusual severity, lasting till the end of November. This was a great hindrance to my sketching, but by taking advantage of every opportunity that offered, I succeeded in obtaining 18 large drawings, of which three are panoramas.

3. As soon as the monsoon was over and the weather became settled, I proceeded on a tour of the hills, but had only been out four days when I received information that my regiment was under orders for service in China, and that I should be directed to join immediately. I therefore returned to Trichinopoly, but shortly after my arrival the march of the regiment was deferred until the end of February.

4. On his Excellency Sir Charles Trevelyan visiting Trichinopoly, I had the honour to show him the sketches I had made, and his Excellency acceded to my proposition that I should at once return to the Pulneys, and complete the series of views of the upper range. I accordingly returned without delay, but had not been a week on the hills when the news reached me that my regiment had received a "forthwith" order to march to Negapatam for embarkation. I therefore rejoined.

5. Though my second visit to the hills was of so short duration, yet, owing to the fineness of the weather, I was enabled to add considerably to my sketches, and visit several localities I had not previously seen.

6. I have now 26 drawings, four of which are panoramas, and the greater portion of the remainder are of large size. Although the series is not so complete as I could wish, yet, I trust when finished, I shall have, as far as the high range of the Pulneys is concerned, sufficient to carry out the intention of Government in deputing me for this duty.

7. Many of my sketches are unfinished. I am taking them with me to China, and hope to complete them during my leisure hours, when they will be forwarded to Government with a report.

8. As it is so uncertain when I shall find time to complete these drawings, I deem it advisable now to mention some of the results of my observations and inquiries during the time I was on these mountains.

9. I wish particularly to remove an impression that the Pulneys are unhealthy for three months of the year, and consequently not a fit locality for European troops; more especially as this opinion has lately been officially laid before Government by a high authority. The greater portion of the eastern or lower Pulneys, it is true, is most unhealthy during the hot months, but this is decidedly not the case on the western or upper range. Several European families belonging to the American mission have been for years in the habit of residing at Kudaikarnal during these months, and those I met spoke most highly of the salubrity of the climate, as also did Mr. Clarke, the collector of Madura, whose family, I believe, passed two hot seasons in the hills without returning to the plains. Some of the natives at the settlement of Kudaikarnal have resided there continuously for years. One who had been a resident upwards of eight years told me he had never heard of a case of jungle fever contracted at Kudaikarnal.

10. I may mention that though I was not on the Pulneys during the supposed unhealthy months, my servants were much exposed in the monsoon to the inclemency of the weather, yet, with the exception of one case of cold and slight fever, they were perfectly healthy, which I have found by experience would not have been the case at Ootacamund under similar circumstances.

11. As far as I could judge during my sojourn on the hills, I am of opinion that the climate of the settlement of Kudaikarnal is milder and more even than that of Ootacamund, though the average elevation of the houses is within a few feet of that of the Ootacamund lake.

12. The present ghaut, viz., Pereacolum to Kudaikarnal, is the only made one; it is little better than a bridle path; the upper portion is very steep, and during the rains is at times dangerous. It is questionable whether a feasible ghaut for carts could be ever made up this pass, but a ghaut passable for carts could be constructed up the old Daradaunputty pass. From the precipitous nature of the upper part of the mountains, a cart road from any other point would be an exceedingly difficult undertaking.

13. From the formation of many of the vallies on the upper Pulneys, large supplies of water might be advantageously stored.

14. An artificial lake at Kudaikarnal might be constructed at a moderate outlay.

15. Horned cattle thrive well at Kudaikarnal, and at the different hill villages. I have no doubt sheep would thrive equally well if kept at night in a warm building with a boarded floor. Horses are apt to get out of condition, the grass being too rank.

16. The grazing ground on the upper Pulneys is very extensive.

17. The introduction of the Toda buffalo on these hills would be a great benefit to the natives, as also would an improvement in their breed of cattle.

18. There is good coffee ground on the slopes of the mountains of the upper range near Colacurry and in the vallies to the westward.

19. I had not an opportunity of visiting the lower Pulneys, but, from all I could hear, the best coffee ground is in that direction. Mr. de Fondclair has a plantation near Perryoor, the only coffee estate on the Pulneys. The owner informed me that the plantation was in a very flourishing condition.

20. Dr. Cleghorn, the conservator of forests, on his visit to the Pulneys, left some tea seeds to be sown at Kudaikarnal; when I left the hills the plants were an inch or two above ground, and appeared fresh and healthy.

21. The wheat and barley grown on the hills is of very inferior quality. Good English or American seed might be introduced with considerable advantage, but, as Mr. Clarke, the collector of the district, informed me, that on one occasion the hill men, previous to sowing some superior wheat he gave them, *pounded it*, under the impression that if it grew and thrived they would be extra taxed, some precaution may be necessary in introducing better grain amongst the ignorant hill tribes.

22. All European fruits and vegetables that grow on the Neilgherries would succeed either at Kudaikarnal or at Shembayanoor. Excellent potatoes, in small quantities, are now produced, and I have no doubt these mountains could supply the whole of India with this important esculent.

23. The Australian acacias and gum trees in the gardens at Kudaikarnal flourish equally as well as they do at Ootacamund. Should there be any prospect of these mountains attracting European residents, it might be advisable to commence planting these trees at once. A considerable supply of young plants and suckers might even now be obtained from the gardens of the settlement, and as these trees are very rapid in their growth, the deficiency of firewood now existing in the immediate neighbourhood would be remedied.

24. In conclusion, I beg to state that, in my humble opinion, the high range of the Pulney mountains would be a most healthy and suitable location for European troops. There is ample room for barracks and plenty of water near Kudaikarnal, on the undulating plateau to the south-west, between the most western house of the settlement and the precipitous detached cliffs called the "tower rocks." There is indeed a scarcity of wood on the plateau itself, but there are large forests on the slopes of the mountains near at hand, down to which passes might be cut. Peat of good quality is found in the swamps.

25. There was no person on the hills during my visit acquainted with the quality of clay necessary for brick-making, but as it abounds on the Neilgherries, it is in all probability to be found also on the Pulneys.

26. The gentlemen of the American mission have built some of their houses of stone, which is found in abundance in the neighbourhood of the settlement, in blocks from the size of an ordinary brick to that of one or two cubic feet. It is easily squared, and is considered by them a good building material, though it is stated by others to absorb too much moisture, and never to dry thoroughly.

ORDER THEREON, 15th March 1860, No. 372.

The Honourable the Governor in Council has read with interest the brief account above given by Major D. Hamilton of the progress which he has made in carrying out the special duty to which he was appointed by the order of 29th August 1859, No. 1326. It is to be regretted that circumstances should have occurred to interrupt the prosecution of the work, and it is trusted that Major Hamilton may be able to resume it on his return from foreign service.

2. Major Hamilton will be so good as to forward to Government his sketches and report when they have been completed.

3. Resolved that a copy of the report be furnished to the Director-General, Medical Department, in reference to paragraphs 9, 10, and 11.

4. Resolved also that it be communicated to the Military Department, the Revenue Department, and Department of Public Works.

(True extract.)
(Signed) T. PYCROFT,
Chief Secretary.

To Major Douglas Hamilton.
To the Director-General, Medical Department.
" Military Department.
" Revenue Department.
" Public Works Department.
Exd. F. Cartledge.

3.—MILITARY DEPARTMENT.—PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letters from the ACTING QUARTER-MASTER-GENERAL of the ARMY, Fort Saint George, 18th March 1861, No. 84, to the SECRETARY to GOVERNMENT, Military Department.

I have the honour, by order of the Provincial Commander-in-Chief, to submit the following reply to the order of Government, No. 873, dated 6th instant, respect-

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ing the reports on sanitaria called for by the Government of India.

2. On the 28th March 1859, in a letter No. 142, a detailed account of every place in use or desirable for use was submitted to Government; and further, on the 11th April last, in letter No. 112, I communicated to Government all that was in my power at that date.

3. Since then the station proposed for the Nagpore force, namely, Moothoor, has been reported on, but its adoption has been negatived* by the Government of India on the ground of its expense at the present moment. Consequently, Chindwarra, formerly a detachment station for European troops, is now occupied as an invalid station; and in my letter to Government, dated 8th January 1861, No. 9, the officer commanding the Nagpore force solicited that a trifling further outlay might be sanctioned.

* *Proceedings of Government, No. 3733, dated 18th October* 1860.

4. Gallicondah was reported on, and orders passed by Government as per margin, and steps are now being taken for preparing estimates and plans for buildings on a higher site; the former experiment having failed on account of the injudicious position selected for the barracks.

29th April 1859, *No.* 1575.
24th August 1860, *No.* 3065.
14th February 1861, *No.* 584.

5. There therefore only remains to be determined a sanitarium for Jaulnah. In my letter dated 11th April, Poona and Mahableshwur were both recommended for adoption until a fixed station could be found. Meanwhile the subject of the abandonment of Jaulnah by the troops of this Presidency has been considered, and the prosecution of the inquiry for a sanitarium was discontinued. Chiculdah, however, appears to possess great advantages. Respecting it, the officer commanding Hyderabad subsidiary force states, "Dr. Cole further stated that Chiculdah seems to be the only place within the Hyderabad territories of sufficient elevation to offer the requisite conditions for a sanitarium. Dr. Cole has since, however, proceeded on privilege leave to Bangalore, without having contributed any of the useful information he had promised, but, from information he had obtained from the Assistant Quartermaster-General, I have no hesitation whatever in stating that to whichever place the abandoned cantonment of Jaulnah may be removed, whether Roza or Aurungabad, Chiculdah would form a most excellent sanitarium for the troops from October to June, but that from the excessive damp and fogs prevailing there from June to October, the place is not habitable by Europeans during those months. There is at present a scarcity of water, except close to the fort of Gowel; inside the fort there are enough stones already cut to build the barracks. There is a very good road from Ellichpore for about 10 or 12 miles, after which to the bottom of the ghaut is rather stony. There is no cart road up the ghaut; conveyances are carried up by coolies. To take advantage of this place as a sanitarium for the troops henceforth to be stationed at Aurungabad or Roza, it will be necessary that the road should be put in order, or that the opening of the railway to Oomrowtie, as suggested by Colonel Davidson, be awaited."

6. In conclusion, I am to add that for stations in the south of the peninsula full use is made of Wellington; for Bellary and Secunderabad, Ramandroog is sufficient; for the northern division a site already fixed, on Grant's range, on the Gallicondah hills, is available; for the Nagpore force, Moothoor and Chindwarra; and for Jaulnah, Poona, Mahableshwur, or Chiculdah. These stations suffice. But as long as money is not forthcoming to take advantage of the climate at Moothoor and Gallicondah the troops at Nagpore and Waltair must continue to be destitute of the means of restoration accessible at other stations.

From the PRINCIPAL INSPECTOR-GENERAL, Medical Department, Fort Saint George, 22nd March 1861, No. 53, to the SECRETARY to GOVERNMENT, Military Department, Fort Saint George.

With reference to proceedings of Madras Government, No. 873, dated 6th instant, I have the honour to remark briefly that reports on the hill ranges of this Presidency, named in the margin, by Dr. Macpherson, Inspector-General of Hospitals, have been duly communicated to Government.

Shevaroys.
Pulney.
Anamallay.

2. Government are also in possession of the facts connected with the recent experiments as to the value of the Gallicondah range in the northern division as a sanitarium for Europeans.

3. The Moothoor range of hills in Nagpore were last year visited and reported upon by a committee of officers, and a site chosen for a sanitarium. The Government of India, however, in letter No. 69, of date 2nd October last, decided not to undertake the experiment on account of the expense it would involve.

4. There appears to be no elevated land in the immediate neighbourhood of Jaulnah or Secunderabad suitable for sanitaria, but in all other commands of the army hill ranges exist, some of which are believed to be more or less suitable for European troops.

5. The sanitaria at Wellington and Ramandroog are already well known. The former, now that the railway is approaching completion from the eastern to the western coast, will be more widely available for invalids from the Presidency, or those brought thither by seaboard.

6. Kamptee is almost the only station destitute of access to a hill sanitarium, and it is a subject of regret that the site fixed upon in the Moothoor range cannot for the present be made available.

ORDER, No. 1159, 28th March 1861.

Ordered to be forwarded to the Government of India, with the letter* marginally noted.

* *From the Principal Inspector-General, Medical Department, 22nd March* 1861, *No.* 53.

To the Secy. to the Govt. of India, Mily, Dept.

Here enter 28th March 1861, No. 1160.

(True extract.)

(Signed) H. MARSHALL, Colonel,
Deputy Secretary to Government.

To the Quartermaster-General.
" Principal Inspector-General, Medical Department.
Exd. G. Rodrigues.

4.—REPORT of the RAMANDROOG SANITARIUM, in the CEDED DISTRICTS, MADRAS PRESIDENCY,—By E. W. EYRE, Esq., Superintending Surgeon.

A range of hills within a short distance of Bellary, that might be made available for a sanitarium for sick soldiers, having become known to the authorities, a medical committee assembled there at the latter end of 1846 to investigate and report on their suitability. From their report I will make some extracts prefatory to the present one.

General Description.—"The hill of Ramanmullay (or Ramandroog) is one of the most elevated of the Sundoor range of hills, and bounds the valley of Sundoor on the west. Its distance from Bellary is considered 37 miles. The road from the village of Yettunhutty leads through the Sundoor pass, the first three or four miles being beautifully wild; the valley now opens out, and through it the road leads to the village of Bovihully, at the bottom of the hill. The approach to the hill from this village is through a low scrubby jungle with a pretty tolerable road; as it ascends the hill it gets very steep and winding, but on the whole is of sufficiently easy access for foot travellers and horses.*

"The platform is of limited extent, being but 1¼ miles in length, and varying in breadth from half to three-quarters of a mile. The general aspect of the surface is undulating, having its higher edge towards the east and sloping gradually toward the west, where in many places it falls precipitously to the plains. The slopes of the hill on both faces are covered with jungle wood of no great size, intersected with numerous wooded ravines. The hill runs nearly N. and by E. and S. and by W. The view towards the W. and N. embraces extensive plains, which in their seasons are covered with abundant crops, dotted with many villages and tanks, and having the meanderings of the Tomboodra seen in the distance. That in the E. and S. looks into the valley of Sundoor."

The barometrical section makes Coomerasawmy, on the same range and about equal height with Ramandroog, 3,400 feet above the sea, and 1,825 feet above Bellary.

Geological Features.—"The rock of which the hill is formed is hornblende, some of the detached pieces of which were found to affect the magnet. On the east, or higher edge of the hill, the rock is seen projecting bare and rugged, but it is broken and disintegrated on its western edge, and the lateritious earth accumulated on it, from the decomposition of the hornblende, is sufficiently abundant to admit of cultivation there. On the northern end of the hill, near the Hospett road, the laterite is most plentiful, and it there almost conceals the underlying rock, which is only here and there seen projecting." * * * * On the western face of the hill the hornblende is stratified, and lower down schistose, and the latter contains a sufficient quantity of iron to render it valuable in the arts, and the villagers

* Captain Walker, of the Engineers, has constructed a road from the foot of the hill to the summit, of so gentle a slope that conveyances can easily ascend; it is four miles in length, and makes the distance from Bellary to the Ramandroog 38 miles.

quarry it there and extract the ore. The soil at the lower part of the platform is considered well adapted for the cultivation of all European vegetables during the season. The trees of any size consist of tamarinds, banians, bur, or Indian fig trees, and mangoes, with a variety of other smaller trees, and during the rains the hill is covered with a profusion of wild flowers and creepers."

Water.—An examination of the water procured from springs on the western side of the hill proved it to be of excellent quality; the supply plentiful, but inconvenience and expense being incurred in bringing it up, the sinking of a well on the summit was considered very desirable. An attempt was made to bore above one of the springs, but the rod broke and there remains. A chalybeate spring was brought to notice by Colonel Henderson, of the Engineers, and some who have used it have thought they derived benefit, but the taste of the water being vapid, and often containing vegetable matter, has not tempted many to drink it.

Climate.—"The general effect produced by the climate has been pronounced by all Europeans to be agreeable to the feelings and most salubrious, giving elasticity and health to the European constitution. The seasons partake of the ordinary divisions in this part of the country, but while the plains are burned up with the hot land winds, no such thing is experienced here. The natives state that the winds are occasionally hot during the hot season, but never uncomfortably so, and to them the hot winds of the plains are unendurable.

"But this statement of the hot winds is not confirmed by the European residents. During the months of March, April and May,—while, at Bellary, the heat is both constant and oppressive, with the thermometer ranging from 96° to 100° in the shade,—it has never been observed to rise higher than 84° in the houses at Ramanmullay during the hottest part of the season, which comprehends the latter end of April and the earlier parts of May. The ordinary heat in these months is about 84° at the maximum in a house, rising a few degrees higher in a tent, and this only for a few hours in the day. During that part of the year, the mornings and evenings are always cool and delightful to the feelings, and all agree in one sentiment, that, even when the temperature rises higher than ordinary, no inconvenience is experienced, as it is generally attended with a delightful cool breeze. Towards evening, in the earlier parts of May, occasional lulls are observed, but they do not last long."

Barracks.—The committee proposed an elevated site for the barracks, but I think a preferable one, as being less exposed, was selected. It was to be of ample dimensions, sufficient to accommodate 25 men, to have a spacious verandah all round, enclosed with glass windows, and a stove was to be provided; a library was recommended, and carpenter's tools to find occupation for the men. A part of the barracks was to be appropriated to a hospital, of sufficient space to accommodate six or eight, for it was well remarked, "that the patients proposed to be sent to Ramanmullay will not often require medical treatment." The medical establishment to consist of a well qualified apothecary, which, under the occasional visits of the superintending surgeon, is considered sufficient." * * * "The men being in the barracks should be dieted as in garrison, and live under military discipline."

"It may not be irrelevant to state that sanataria have been established for many years on the Neilgherry and Mahableshwur hills in Southern India, and at Landour and Darjeeling, Musoorie and Simla, on the lower range of the Himalayas. Mahableshwur is 4,500 feet above the level of the sea, the others mentioned are at elevations varying from 6,000 to 8,000 feet. Ramanmullay 3,000, and the experience acquired at these stations gives some grounds to show the diseases likely to be benefited by a residence at Ramanmullay, only the analogy is not complete, from the lower elevation of this hill."

"The committee consider medical officers, whose duty it may be to select cases, should be reminded of the importance of this duty; that, while some of the diseases which are contracted in the country are cured, or curable by a residence in hill climates, yet, for other diseases, no benefit is derived, and to some the climate proves positively injurious."

The committee summed up by expressing their opinion that the climate of the Ramandroog is favourable for the preservation of health of Europeans, and calculated to restore the energy of such European officers and soldiers as have suffered either from the effects of residence in India, or from disease, more particularly functional. The establishment of a sanitarium was recommended. To the judgment exercised by the committee, ample testimony will be borne in the results obtained during the last ten years.

The Ramandroog from its comparatively low elevation compared with other hill sanitaria, would not lead to great expectations being formed of it by those who regard elevation as the chief object in selecting the site of a sanitarium; but we shall find that, while it possesses decided advantages, it has also claims to preference over more lofty localities. No hill diarrhœa infests it as at the Bengal sanitaria; and while Mahableshwur cannot be occupied during the rains, Ramandroog may be throughout the year. It is not from mere elevation that salutary effects follow; we must ascribe a large share to other causes, such as purity of atmosphere, which is found on the Droog without the rarity which, on higher elevations, often leads to congestion of the internal organs. A sudden change from the plains to the Droog has never produced any bad effects; indeed, if benefit is promised, it shows itself in a very short time; there is no intermediate stage of seasoning. Added to pure atmosphere, how great must the effect be of a change from the bed of sickness, and that within a hospital, to picturesque scenery, hill and dale, the eye resting upon verdure on every side.

I shall now give the tentative steps that led to the establishment of a Sanitarium for European soldiers; and these I extract from reports made by me when in medical charge of the 1st Madras Fusiliers.

1849.—"At all times but during the rains,* the Ramanmullay would seem to offer a desirable sanitarium to the European regiment stationed at Bellary. A trial was made last year; 18 were sent in April and returned in June. Half the number derived decided benefit, the remainder did not; perhaps their diseases were not adapted to a hill climate. It must be borne in mind, too, that the accommodation provided was but of a temporary, and therefore, indifferent, description in tents; in a more suitable building still further benefit might have resulted. A favourable report was furnished for the information of Government after the return of the party, and an application has been submitted for permission to send more invalids this year. After a second trial the character of Ramandroog as a sanitarium will, I trust, be so fully established as to lead to a permanent establishment there. During eight months of the year it might be resorted to by the sick; they could be transferred there without delay, with little or no fatigue, be always under supervision, and be returned to duty when their health admitted of it. A building to accommodate 35 or 40 would be large enough. I believe such a sanitarium would supersede the necessity of sending many cases of disease to the coast."

1850–51.—"As regards the sanitarium at Ramandroog, I can report satisfactorily: marked benefit was derived in cases mentioned in last year's report as the most eligible, viz., where there was constitutional or acquired debility. The epidemic fever in 1850 furnished just such cases; the men left Bellary 9th December 1850, pale and debilitated; after a fortnight's residence they had made a decided improvement, and after from one to two months' sojourn, returned stout and fresh coloured as though just landed from England. The few cases that derived no benefit did not disappoint; they had very chronic ailments, were constitutionally unhealthy, and there being sent was in the way of trial. Sufficient proof has now been afforded, I conceive, that Ramandroog is a most desirable sanitarium for European troops at Bellary. I am persuaded that many of the cases transferred to the Mount would derive more benefit on this hill.† Besides climate, other advantages may be pointed out: 1st, one, two, or at most three months would be sufficient on the hill.‡

Men sent to the coast are away six months at least, 12 months' absence is common enough, and even 18 months not very uncommon. 2d. The march to Ramandroog is performed easily in three days;§ an officer is in command, who remains with the sick party. The march to the Mount occupies 32 days, is under a non-commissioned officer, who cannot control drinking, and this sufficiently accounts for some of the patients arriving at their destination worse than when they left the regimental hospital. 3d. The sanitarium at Ramandroog permits of a great amount of liberty being allowed, a circumstance which aids in no small measure a salubrious climate to the invalid's recovery. At the coast (St. Thomas' Mount) liberty must necessarily be more restricted. In regard to accommodation, the convalescents have been more favourably circumstanced this year than last, for instead of tents they have occupied a building, indifferently, however, adapted to the requirements. A greater amount of benefit than what has already been obtained, might reasonably be expected if a substantial building constructed to resist the cold and damp, at the same time well lighted and ventilated, was erected."

* This opinion underwent a modification afterwards.
† *Vide* Table in Appendix 2.
‡ For some cases a longer residence is desirable.
§ Four marches would be preferable. 1st, Coortany, 2nd, Yetenhutty, 3rd, Bovihully, 4th, Ramandroog. It would be desirable if the 2d march could be divided as it is a long one, between Coortany and Yetenhutty.

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A third party of invalids went to the Droog in the latter part of September 1851, remaining till 30th July 1852, with much benefit to all but cases of pulmonary disease. They returned then in consequence of the regiment leaving Bellary for foreign service.

"When the duty devolved upon me to send sick to the Droog in 1849, I was not aware of the existence of the report of the Committee in 1846, and had therefore to exercise my own discretion in the selection of the cases with a view to test its sanitary effects. By attentively watching the progress of each case, I felt myself warranted in giving the opinion I did in my report to the Medical Board. Several cases were sent by me then which I should now avoid sending. But, while experience points to those who have derived decided benefit and those who have not benefited at all, there remains a class to occupy a doubtful place, of which it cannot be predicted with certainty whether benefit or not will result. There are cases, however, though not coming under the head eligible, which might be sent to the hill as a measure of necessity, to escape the heat of Bellary in April and May. The table appended, No. 1, exhibits a striking feature in regard to the effects of the Droog on disease. It will be seen that this is decidedly favourable or unfavourable for the middle place. "Partial benefit," is in very small proportion to the "Recovered," and "No benefit." The deduction is important as regards the due selection of cases to send. When it is found that all who have been sent on account of debility, constitutional or acquired, nervous palpitation of heart, the effect of the former, and some local diseases, such as ulcers, maintained by a weakly constitution, have recovered, there is ground to maintain that the Droog will fully answer the expectation that was first entertained, provided care is taken to select the cases, and in an increased measure when the building now in progress shall ensure requisite shelter and comfort for the invalids."

In consequence of the favourable reports made, and the warm support afforded by General Steel, then commanding the ceded districts, Government sanctioned the erection of a barrack and a hospital detached; the former to accommodate 80, and the latter 10. Both have ample space and are in every respect commodious. They have fire-places, which are needed in wet boisterous weather. Experience has corrected some errors, and also established the opinions first entertained as to the adaptation of the Droog for a sanitarium. It has been proved that for many cases it may be inhabited throughout the year. The rains are not heavy enough to preclude this; they rarely fall for any length of time continuously, and the water rapidly drains off. Fogs prevail at that season, coming on at sunset and lasting till 9, 11, or 12 o'clock in the day; but though the mist clears off, the sky above is loaded with vapour, so that during the monsoon the sun is rarely visible; but these fogs are not found at all injurious, if active exercise can be taken and there is a due amount of vigour in the constitution to resist the effect of damp; where this is not the case, another season should be chosen for the invalid. September and October are delightful months; the atmosphere is no longer saturated with moisture, but is clear and bracing; and, while occasional showers maintain the verdure that covers the hill, a profusion of wild flowers adds to the beauty of the scenery. During the cold season the easterly winds are at times strong and unpleasant, but the prevailing character of the weather is remarkable equability of temperature, the thermometer ranging but a few degrees throughout the 24 hours. This gives the Droog a great advantage over the low country, where the range, during the cold season, is so great and trying to delicate constitutions. Although, during the hot season, from March till the setting in of the south-west monsoon, which varies from the middle to the end of June, the Droog loses much of its charms in regard to the scenery; it is then that its great benefits to the invalid, and its advantages in maintaining health, are most striking. This is well shown in the case of children; the pale face assumes the rosy hue of health; the appetite that in the plains had been falling off there acquires a keenness that it is pleasurable to witness. At this season a westerly wind blows in the morning, when exercise is much enjoyed. At about 11 a.m. the breeze dies away, and the day becomes warm, at about 3 or 4 o'clock so much so that a punkah is grateful, but it is comparative heat only, for, after what is felt at Bellary, it is not to be regarded. At 7 or 8 p.m. the sound of the westerly wind is heard coming across the plains; soon it reaches the Droog cool and balmy, and under its influence the nights are passed in sound refreshing sleep. It is to be regretted that no full or accurate meteorological observations have been kept from the first occupation of the hill; but the temperature, amount of moisture, and fall of rain are now being registered so as to ensure accurate results. The table appended gives the observations for 12 months. I think it will be found that there is a difference of 10°, at least, between the Droog and Bellary, this from sunrise to sunset. Were the observations taken throughout the 24 hours, there would be a much greater difference; but it is on the Droog as elsewhere, the index of the thermometer is not the test of sensible heat, I mean appreciable by the sensations. I have seen the thermometer stand as high as 90° indoors, but there was a cool westerly breeze blowing, and no heat was felt. In support of the deductions made at the close of my report of 1850, further experience enables me to add that the sanitarium is especially suited to cases of constitutional debility, chiefly found in lads who were ineligible when recruited (and some of whom will never, under the most favourable circumstances, turn out as physically efficient as soldiers should be); also where disease has weakened the general powers, there being no organic lesion present. For debility or morbid sensibility manifesting itself under the form of "nervous heart," the Droog is equally efficacious. For rheumatism, a modified opinion must be given, as this troublesome affection shows itself under very different characters, often associated with other diseases, as syphilis. Rheumatism excited into action, or maintained by atony of the digestive organs, would be benefited; not so the marked rheumatic diathesis. Syphilis, primary or secondary, scrofula, ulcers, or other local affections dependent on depraved habit of body, are ranked in the table under "No benefit," but I would modify this opinion by saying that diseases depending on vitiated blood cannot be expected to be *cured* by a mere residence in the best climate. Time must effect the cure, yet it is of great importance to aid by every means available, and there can be no question that cases of secondary syphilis, scrofula, constitutional ulcers, &c., will be under more favourable circumstances for time to work a cure, on the Droog, than if confined to a hospital in the plains. To expect a perfect cure, as the result of mere residence at any sanitarium in such cases will in most instances meet with disappointment. Some of such cases have ultimately recovered, after prolonged residence, others have not, but have had to be transferred to the presidency for disposal. But there is a third class of diseases to be considered, for which the hill climate proves decidedly injurious. This comprises pulmonary affections of all kinds, and diseases of the liver and bowels, when the morbid process is still in operation. When this has been subdued, then, for the subsequent debility, and the effects of long confinement to hospital, the Droog decidedly benefits.

Not only is judgment needed in selecting the suitable cases; but I consider there should be a selection of the seasons in which to send them. Invalids suffering from general debility, constitutional or acquired by disease, of the effects of high temperature, may be sent at any season; but where a choice can be made the cold season should be selected, and the invalids should remain till the termination of the hot weather, about the middle of June. Cases of chronic rheumatism, particularly if associated with secondary syphilis and scrofula, had better not arrive at the sanitarium before February, and should leave at the end of June.

I would, in conclusion, offer the following remarks:—To preserve the sanitive influence of the Ramandroog, it is essential that the woods should not be cut down, as was done extensively at one time, and still is, though to a less extent. Strip the hill of trees, and a large mass of rock and ironstone would be left, and its salubrious character would depart. It would be well to replace the trees on the plateau that have been cut down; this would cool the surface and obviate glare in the hot season, and break the force of the strong westerly winds. Highly advantageous as sanitaria are for restoring health to the invalid, great care is needed that they do not become detrimental to the morale of the soldier, by fostering idleness, slovenly habits, &c. Hennen thus writes of a convalescent depôt in the Mediterranean:*—"I would recommend the convalescents should be made to perform duties of an easy description, and which would not expose them to the sun or night air. This would both tend directly to improve their health and obviate idleness, which is the greatest enemy to their recovery. As their health becomes re-established, they should be returned to their respective corps by every favourable opportunity." Easy drill, short marches, and any employment, even the construction of roads, the cultivation of gardens, where everything is so favourable for it, a library for such as derive pleasure from reading—these, and other means which an active interest on the part of those concerned would lead them to adopt, greatly promote the sanitary effects of the Ramandroog sanitarium. Nowhere should the "*nimia diligentia medici*" be more avoided than at a sanitarium. The restorative effects of change of climate and of scene should be allowed full scope, yet it is difficult to get young medical practitioners to appreciate this; even amongst the seniors it is not easy to dispossess some minds of the per-

* Medical Topography, Ed. 1830, page 560.

suasion that every deviation from health should be met by a course of physic.

Bellary, 8th June 1858.

Note.—The invalids have latterly been weighed on arrival and departure. Had I fully appreciated the value of this test of health, I should have adopted it from the first establishment of the sanitarium. I am indebted to Dr. A. Thomson, Her Majesty's 58th Regiment, who has written on the subject, for my knowledge of its great use in hospital practice, so obvious that a weighing machine should be found in the receiving room of every hospital.

Table III. gives the result of weighing 20 men.

TABLE I.—Showing the NUMBER of INVALIDS sent to the RAMANDROOG SANITARIUM, their DISEASES and RESULTS, from 1848 to March 1858 inclusive.

—	Sent of each Disease.	Recovered.	Partial Benefit.	No Benefit.	Died.	Remarks.
General debility, constitutional, or consequent on fever or deranged health, without local disease	129	127	2	0	0	
Nervous palpitation of heart	7	6	*1	0	0	*Health improved, but continued subject to palpitation.
Rheumatism	7	7	0	0	0	
Secondary syphilis and rheumatism complicated with syphilitic taint	30	13	5	10	2	
Primary syphilis in unhealthy constitutions	6	2	1	2	1	
Impaired health consequent on venereal chiefly, and long confinement to hospital	45	43	1	1	0	
Scrofula	18	4	0	3	1	
Bowel complaint	10	5	2	3	0	
Ditto ditto convalescents from	6	6	0	0	0	
Pulmonary affections: Pneumonia, 2; Bronchitis,* 8; Phthisis, 1; Asthma, 1	12	0	*2	9	1	
Hepatic affections	14	4	0	8	2	
Ulcers and eruptions connected with depraved habit of body	12	2	0	10	0	
Disease of kidney and bladder	3	0	0	2	1	
Ophthalmia with impaired health	2	0	†2	0	0	†Health benefited, but not the local disease.
Total	300	218	18	56	8	Nearly all the deaths in men very ill when sent.

Per cent. of recovered to number sent - - 72·66
Ditto. no benefit, ditto - - 19·45
Ditto, of partial benefit ditto - - 6·
Ditto died ditto - - 2·74

TABLE II.

—	—	Recovered.	Partial Benefit.	No Benefit.	Died.	—
Invalids sent to Ramandroog	a60	38	8	12	2	a Accommodated in tents or a temporary building before the present barracks and hospital were erected.
Ditto to the Mount.	b60	24	9	14	13	b The cases not selected, but taken consecutively as they stood in the books.

TABLE III.

		st.	lbs.	
2	Gained	1	9	each.
5	Ditto	1	0	ditto.
13	Ditto	about ½	0	ditto.
20				

The MONTHLY and ANNUAL MEANS of the METEOROLOGICAL REGISTER kept at BELLARY, and at the RAMANDROOG SANITARIUM for the Year 1857.

—	Bellary.					Ramandroog.				
	Dry Bulb.	Wet Bulb.	Per Cent. of Moisture.	Sun's Rays at 4 P.M.	Rain.	Dry Bulb.	Wet Bulb.	Per Cent. of Moisture.	Sun's Rays at 4 P.M.	Rain.
January	75	68	64	100	0·0	70	62	68	87	0·0
February	84	73	67	105	0·0	80	63	43	95	0·0
March	87	78	73	102	5·17	80	70	53	94	0·5
April	93	78	62	122	0·12	80	65	47	99	1·10
May	87	82	79	99	2·29	76	79	67	92	9·6
June	83	79	77	94	3·22	72	69	86	79	5·0
July	82	76	73	91	0·77	70	69	70	73	11·5
August	80	70	65	89	0·0	69	69	90	72	1·0
September	81	73	69	91	0·98	70	68	74	79	2·10
October	76	72	70	93	7·62	63	67	78	91	8·18
November	75	66	61	103	1·10	69	63	72	89	3·30
December	73	62	56	114	0·0	67	61	72	89	0·0
Average Annual Means	81	73	68	100	21·27	73	66	71	87	44·0

INSPECT.-GEN. MACPHERSON'S REPORT. MADRAS.

REPORT OF INSPECTOR-GENERAL MACPHERSON.

REPORT by INSPECTOR-GENERAL of HOSPITALS, Dr. MACPHERSON, H.M. Madras Establishment, in answer to the Questions of the Commissioners.

(Chiefly, but having reference to sanitary details generally affecting all India).

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Map
EXHIBITING the ELEVATED MOUNTAIN RANGES & SOLITARY HILLS
CONTIGUOUS TO THE
Chief Military Stations in the Madras Presidency.
To illustrate
Inspector General Mr Duncan Macpherson's Report
IN REPLY TO THE
Questions by the Royal Commission on the Sanitary State of the
Indian Army
ALTITUDE POSITION AND APPROXIMATE ELEVATION OF THE CHIEF MOUNTAINS IN THE MADRAS PRESIDENCY
Names of Mountains
Madras District
Pulicat
Shevaroy Range
Green Hills
Yercaud
Neilgherry Range
Dodabetta
Coonoor
Wellington
Coonoor
Kotagherry
Kaity
Kotagherry
Ootacamund
Malabar & Canara
Tellicherry
Mangalore
Mangalore
Cannanore
Calicut
Calicut
Paniany
Malabar Range
Tinnevelly
Courtallum
Coorg
Mercara
Mysore
Bellary
Ramandroog
Vizagapatam
Gangam
Cuttack District
Nizams Dominions
Nagpoor & Hossingabad
Pachmurree
Mooltye
Chundwarra
Sea Coast Sanitaria
Waltair near Vizagapatam
Point Calimere near Negapatam
Port Kid Bay near Sedashegur
MOUNTAIN AND SEA COAST SANITARIA FOR EUROPEAN TROOPS, IN THE MADRAS PRESIDENCY
Military Posts
Names of Mountains Contiguous
Madras
Trichinopoly
Cannanore
Bangalore
Bellary
Vizagapatam
Secunderabad
Jaulnah
Nagpoor
Shevaroy & Neilgherry Hills
Palney & Neilgherry Hills
Anamallay & Neilgherry Hills
Neilgherry Hills
Ramandroog
Galley Kondah
Ramandroog & Galley Kondah
Chinalda & Deoldaun
Chundwarra & Puchsmutty Hills
Approximate Distances by Sea of the undermentioned Places
From Calcutta to Madras 870 miles
" Madras to Negapatam 170 "
" Negapatam to Tuticarin by Palk's Pass 200 "
" Tuticarin to Point Calimere 150 "
" Bombay to Beitool Bay 560 "
" Bombay to Mangalore 150 "
" Mangalore to Beypoor 110 "
General Abstract of the Distribution of the Army in June 1861
Divisions of the Army
Grand Total
SCALE 32 Miles to an Inch.

PREAMBLE.

During the past three years my duties have led me over the entire area of this Presidency, to inspect our Military Hospitals and Medical Establishments, to inquire into the sanitary condition of our garrisons and cantonments, and to report on everything affecting the health of the army, European and native. I have visited our sanitaria and hill stations, and also examined such elevated ranges contiguous to our military posts as appeared to be suitable for troops, and now, in obedience to the commands received, I proceed to record the result of my inquiries into the different subjects submitted in the foregoing questions.

My observations will appear in the order of my inspection, as shown in the index, which also exhibits the sickness and mortality at the Civil and Military Establishments throughout the Presidency during the twelve months prior to the date of my visit to each station. Some of these will be passed over with a few brief remarks; others, where for instance European troops are located, will be treated more in detail, and finally, in accordance with clause 14 of the Royal Commissioners' queries, I will submit my views on other important subjects which bear essentially on the sanitary condition of the country and the Indian Army; as—

The beneficial effects of change to the soldier in health and sickness, from the arid plains to the coast, to elevated mountain ranges, or to the lower summits of solitary hills; the length of time a soldier should serve on hills and plains; a description of the existing sanitaria in the Madras Presidency, and of places where others might be advantageously established as a residence for the preservation of health, and in convalescence from disease, to the soldier serving in Bengal and Bombay as well as in this Presidency.

The destructive effects of debauchery and of venereal disease on the health of the soldier, and the loss of efficiency resulting therefrom; the precautionary measures necessary to preserve them from these irregularities, and to protect them from epidemic disease; the best age and season for a soldier to land in India; the best mode of disposing of him on landing and during his first years of service.

The importance of the removal of surface filth before it accumulates; observations on barracks, hospitals, and outhouses; defects in their site, aspect, and construction; importance of superficial and deep drainage; remarks on furniture, beds, dress, diets, &c.; necessity for medical inspections, and for the introduction of instruction, trades, and other recreations as part of a soldier's duty in quarters; position and regulation of burial grounds.

The necessity for the introduction of efficient ambulance arrangements for the conveyance of hospital equipments and the transport of troops in health and sickness; simplification, assimilation, and reduction of hospital records and returns; the want of returns to exhibit the sanitary condition of the soldier's family and the civil European population throughout India; remarks on the duties of medical officers, and the qualifications necessary for administrative appointments.

These are the chief points adverted to by the Royal Commissioners. It would be a work of supererogation in me, however, to do more than generalize on the subjects, as special reports are called for from officers resident at each station relative to their respective localities.*

Stations.	Replies.
I. Chingleput.	1. This station is 35 miles south-west of Madras, on the great military road to the southern division of the army. The general aspect of the country surrounding the station is little above the level of the sea. The surface soil is sandy, covered with scrubby jungle, or bare and interspersed with barren hills and detached masses of granite. The town of Chingleput lies about half a mile south-east of the station. It is clean and airy, the Palar river running close to it. An artificial lake, which, when full, is two miles long and one broad, lies within half a mile of the station; but in the dry season, when the water becomes low, a strong odour arises from the decay and decomposition of the weeds on its bed. 2. The collectorate and zillah of the district occupies this station. The troops† consist of a strong native guard over a large body of prisoners incarcerated within the fort. The hospital for the reception of their sick is low, surrounded by walls, shut up on the rear, and entirely without roof ventilation. Here, as at most of our stations throughout the Presidency, civil hospitals and dispensaries have been established by the local community, assisted by a grant in aid from Government, to afford relief to the poor and diseased inhabitants of the station and country around. Government supplies the medicines and provides professional aid to the sick. Some idea of the good effected by these establishments may be formed by referring to the index. But as neither this topic, nor that of jails, form any part of the subject of the present inquiry, I will not swell my report by again referring to them.
II. Cuddalore.	3. The zillah of Cuddalore, the capital of South Arcot, is situated on the coast, 112 miles south of Madras. Its elevation is not more than 5 feet above high-water mark. The soil around is sand, with clay beneath. There are patches of rich cultivation, but no jungle or hills in the neighbourhood. The climate is very equable, relaxing in its effects, but favourable to convalescence from acute attacks. 4. Until lately Cuddalore has been the depôt for European pensioners and invalids from all parts of the Presidency, who were compelled to reside there. But now they go where they please, consequently the number at Cuddalore has been much reduced. Calculated for a period of nine years, the admissions into hospital averaged 60 per cent. on the strength, and the deaths 10 per cent. on the treated. The hospital and the pensioners' lines are situated close to the muddy bank of a river or swamp, which, when not flooded by the tide, emits odours most injurious to health. The hospitals for the European invalids, as well as that for the native guard of sepoys‡ over the gaol, are without ventilation or conveniences; and, everything considered, Cuddalore appears to me to be a most improper place, in a sanitary point of view, to select as a final resting-place for the old and worn-out soldier.§ 5. I may here observe that, at the French settlement of Pondicherry, a few miles to the east of this station, the diseases of India, dysentery and hepatic affections, are almost unknown. This exemption to diseases so fatal to English residents in India may be attributed to the admirable system of drainage and other complete conservancy arrangements enforced within the town and in its environs.
III. Trichinopoly.	6. This cantonment, the head-quarters of the southern division of the army, is distant from Madras 207 miles. It is placed on an extensive plain, interspersed with numerous insulated masses of rocks, which either rise in irregular shapes to a great height, or are dispersed in large detached tabular masses. The predominating surface rock is the secondary or transition granite, the lower being trap and greenstone. The soil around the cantonment and town is sandy and gravelly, or a rich black loam; where there is a sufficient supply of water

* The foot notes in the Report are by his Excellency Sir Patrick Grant, Commander-in-Chief, who permitted me to submit it to him prior to sending it in officially.

† The military guard has been withdrawn, and the duties are now taken by the police.—P. G.

‡ The duties are now taken by the police, there are no sepoys at Cuddalore.—P. G.

§ The selection is their own entirely.—P. G.

Inspect.-Gen. Macpherson's Report. Madras.	Stations.	Replies.
	III. Trichinopoly—*cont.*	it becomes remarkably productive. The climate for eight months of the year is exceedingly sultry. In March, April, and May the country is entirely burnt up. The mean annual temperature is 86°; the greatest heat in the shade is 102°; the lowest, 68°: but when exposed to the sun the thermometer rises to 140° of Fahrenheit. The average fall of rain varies between 30 and 40 inches per annum. 7. It is computed that the native population in the town of Trichinopoly exceeds 100,000 souls. The streets are rather regular and clean, and there is tolerably free ventilation through the dense mass of low, closely-packed huts. But the suburbs of the town and environs of the military cantonment are resorted to by the natives for the purposes of nature. The offensive odours and injury to the public health from this excessive accumulation of surface filth will be apparent to all. Added to this, the burial grounds are close to the public roads, or in crowded parts of the cantonment, and the soil is daily disturbed to deposit bodies, which are now being piled one over the other. This great sanitary error might easily be remedied by the erection of public latrines, by closing the present burial and burning grounds, and selecting other spots at some distance. 8. By means of artificial irrigations from the river Cauvery, the cultivation of rice is brought close up to the station; but this does not appear to exercise a prejudicial effect on the health of the troops. Indeed, it has been observed that a marked change for the better takes place in the climate of Trichinopoly when there is a sufficient supply of water to cover the face of the country, and when the dry sultry atmosphere and intense radiation of heat, the usual characteristics of the station, give place to vegetation. 9. The space occupied by the barracks and officers' houses covers an area of between six and seven miles. The established military force for the station consists of— 1 light field battery.—P. G. 1 company of European artillery. (Reserve).—P. G. 1 regiment of European infantry. 1 regiment of native cavalry. (Which is to be withdrawn).—P. G. 4 regiments of native infantry. (To be reduced to 2 Regts. N.I.)—P. G. The European artillery are quartered on raised ground, in a lofty, well-ventilated building near a good stream of water. There is a mango tope contiguous to the barrack, where the men amuse themselves in the shade. The quarters allowed to the married men and families are defective in size and ventilation, and the hospital for both is too small, having also the great objection of being under the same roof as the barrack. 10. The barracks for the European regiment have long been condemned as habitations for human beings. They form a quadrangle, one portion being tiled and the other bomb-proof. In breadth they vary from 5 to 6 feet, and their height does not exceed 12, having no adequate roof ventilation; in fact they are not equal to the horse stables now constructed. The men are at present closely distributed in temporary well-raised barracks, and it is in contemplation to erect new accommodation for them on the most eligible spot which the vicinity affords. 11. In a military point of view, necessity may render the erection of European barracks for 1,000 men at this station imperative; but, sanitarily considered, I am opposed to the measure. True, the climate of Trichinopoly does not present a marked death rate much in excess of what occurs at other stations. But, independent of the actual mortality, there are other considerations which have to be considered, and the chief of these at this station is the depressing climate, which enfeebles the nervous energy and disposes to relaxation of the muscular fibre, causes which must operate directly and indirectly on the efficiency of the European soldier. I will hereafter show, when I come to treat on hill stations, how this may be remedied by locating a portion of the European force on certain elevated ranges within the division, so as to admit of a wholesome interchange from the plains to the hills, with much advantage to the health of the soldier, and possibly without disturbing existing military arrangements to a great extent. 12. The hospital for the sick of the European regiment is a well-ventilated, commodious, and lofty building capable of accommodating 100 beds. Each ward is provided with punkahs, and there is an air of comfort throughout. A wall 10 feet in height encircles the building within a few yards; this is a great objection, for the powerful heat of the sun is necessarily absorbed by or reflected from it during the day, and it impedes, especially during the night, the free circulation of air within the court. There is a female ward in the centre of the court, which is also objectionable. It is in too close proximity to the men as they pass and repass to the privy. A lavatory and bath-room is urgently required, there being but one bath-room for men, women, and children. 13. Amongst the Europeans of the force, venereal affections form the largest number of admissions into hospital. Thoracic and hepatic affections and bowel disorders being the prevailing diseases. During a period of 15 years prior to 1856–57, 14,221 European soldiers served in this division of the army. The following table exhibits the sickness and mortality amongst them during that period as contrasted with 1857–58, when the number on duty did not exceed 491, from the under-mentioned diseases:—

	Cholera.		Fevers.		Liver.		Diarrhœa and Dysentery.		Venereal.		Rheumatism.		Thoracic Diseases.	
	Treated	Died	Treated	Died	Treated	Died	Treated	Died	Treated	Died	Treated	Died	Treated	Died
Admissions and deaths from 1842 to 1856–57	201	101	6,270	58	936	36	3,151	103	33,133	5	1,388	3	1,048	30
Treated to strength per cent.	1·4		44·09		6·5		21·12		22·03		9·7		13·10	
Deaths to do. do.	0·7		0·4		0·2		0·23		0·03		0·02		0·20	
Admissions and deaths in 1857–58	7	2	95	—	49	2	115	1	133	—	53	—	38	5
Treated to strength per cent.	1·4		19·3		9·9		22·13		27·08		10·07		7·7	
Deaths to do. do.	0·4		—		0·4		0·2		—		—		0·10	

Stations.	Replies.
III. Trichinopoly—*cont.*	14. The native portion of the force are accommodated here, as they are at all other stations of the army, in huts built of mud, roofed with straw or tiles. In the construction of these due precautions are taken to form the streets of sufficient width, and open to the prevailing winds. Officers commanding regiments being responsible that proper conservancy arrangements are enforced. The climate of Trichinopoly is very favourable to the health of natives. The native town is seldom altogether free from sporadic cases of cholera. But fever, venereal, and rheumatic affections form the large proportion of their sick.
IV. Tanjore.	15. The town of Tanjore is 33 miles east of Trichinopoly. The district around comprises the delta of the river Cauvery. The climate is considered salubrious, free from miasmatic exhalations, and the inhabitants are reported to attain a great age. The Cauvery usually fills in the months of June and July by the south-west, and again in November by the north-east monsoon. The distribution of water is regulated by anicuts or dams across the river, the water being then conducted by irrigating channels, thus converting what otherwise would have been an arid and barren plain into perhaps the most fertile, rich, and populous district in this Presidency. The military force at this station at the period of my visit consisted of one company of Europeans and one of natives, detached from Trichinopoly and relieved at short intervals of time. The troops were healthy, and the arrangements made for their accommodation were satisfactory in every way.
V. Comboconum.	16. The district around the station is a continuation of the rich delta watered by the Cauvery, and is equal in salubrity to Tanjore. A detachment of sepoys from Trichinopoly garrison the station. They are very healthy. But the jail, which occupies a low sandy piece of ground near the river, is perhaps the most unhealthy jail in the Presidency, although every attention is paid to cleanliness, &c. The fact is, we have here a striking instance of the evil effects directly and distinctly traceable to defects in the site, aspect, and construction of this building. The drainage is bad and cannot be improved; the privies are close to the wells. The space around the cells is too circumscribed by high whitewashed walls, which throw out great reflected heat during the day and retained heat at night; the cells are badly ventilated, and finally the walls and floors have become so polluted by miasmata that the jail pestilence pervades every quarter of the building. Strong healthy men no sooner enter the precincts of the jail than they droop in health. Diarrhœa rapidly runs on to ulceration, anasarca and death; ulcers are common, and the smallest abraded surface assumes an unhealthy action. Since the date of my visit to the place praiseworthy attempts have been made to improve the sanitary condition of the building by scraping the walls, renewing the floors, improving the ventilation, and altering the position of the privies. But the good that resulted was only temporary.
VI. Negapatam.	17. This seaport will ere long become a place of importance as the terminus of the Trichinopoly railway, which passes through the rich district of Tanjore, and not far from the base of the lofty Pulney hills, which in elevation and climate vie with the Neilgherries. At this port troops disembark and proceed to Trichinopoly, which is 100 miles inland. It possesses an equable and moderate temperature, and enjoys considerable immunity from disease. A small detachment of sepoys from Trichinopoly garrison the place.
VII. Tranquebar.	18. Tranquebar was until lately a Danish settlement. A detachment from a native regiment at Trichinopoly now garrisons it. On account of its salubrity and the buildings in the fort appropriate for the purpose, it was at one time in contemplation to make it a coast sanitarium. But although well adapted as a residence for people in health, it has been found to retard rather than promote convalescence after acute attacks.
VIII. Madura.	19. This zillah lies 83 miles south of Trichinopoly. A small detachment of native troops garrison it. The district is subject to periodical visitations of cholera. But the inhabitants are prosperous, and the land, which is watered by both the south-west and north-east monsoons, is highly productive. The native town is a pattern for cleanliness, and the streets are spacious. A chain of mountains taking a south-east course divide the district from Travancore; a continuation of the same chain extends in a north-east direction to within 20 miles of Trichinopoly. I will reserve my observations on these hills until I come to treat on the subject of mountain ranges generally.
IX. Tinnevelly and Palamcottah.	20. The former is the civil and the latter the military station of the district, both being contiguous. The general aspect of the country is a level plain extending for many miles, interspersed with rounded stony hills. The land is fertile and extensively irrigated by cuts from the Tambaravary river, which deposits a quantity of alluvium annually on the rice lands. The soil on the higher grounds is a red sand strongly impregnated with iron, forming a clay which produces good cotton crops. A detachment of European artillery were formerly stationed at Palamcottah, now a regiment of native infantry garrisons it. The barracks and hospital occupied by the artillery are spacious, well-aired, and lofty buildings. The men are very healthy, and a judicious system of conservancy is kept up in the native town.
X. Quilon.	21. Is a military post on the coast within the territories of the Rajah of Travancore. The surface of this country to the east is mountainous, elsewhere it is varied with hill and dale, and well watered. Some of the hills attain an altitude of 4,700 feet, with table land on the summit, and being not far removed from the sea, the climate is admired by those who resort to it. Quilon is famed for its salubrity. Cholera rarely visits it. A prolonged residence at the station relaxes the system; indolent ulcers, cutaneous diseases, and elephantiasis being the prevailing diseases.
XI. Cochin.	22. A detachment of native troops garrison this town, which, in a commercial point of view, is one of the most flourishing on the coast. The climate is never cool or bracing. There is always a degree of moisture in the atmosphere, and the temperature throughout the year is very equable, a continued drought being almost unknown. The maximum thermometer is 85°, and the minimum 78°. Venereal disease in its worst form is the curse of the town.

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XII. Calicut.	23. A detachment from the European and from a native regiment at Cannanore garrison this place, to overawe a dense population of fanatic Moplahs who inhabit the town and country around. The town is a little above the level of the sea, but by judicious arrangements the surface water does not lodge, but is carried away by stone channels. The great sanitary defect in the place are the burial-grounds in the centre of the dense population; but I will reserve my observations on this subject until I come to treat on the subject of the burial of the dead. Cholera at times makes terrible inroads amongst the population. Bowel disorders terminating in anasarca and cutaneous affections, being the prevailing diseases of this place. The European portion of the garrison are accommodated in commodious private houses.* They have every comfort, and their sanitary state is satisfactory. The native soldiers are also well cared for.
XIII. Malliapoorum.	24. At this outpost, which is 36 miles inland from Calicut, a detachment of Her Majesty's 66th Regiment soldiers are stationed. The men have been very healthy. I found only two men on the sick list; their barracks and hospital occupy an elevated ridge of ground, are well raised, lofty, freely ventilated, and sufficiently commodious. The men have a small library, and the officer in command encourages them to amuse themselves on the skittle and cricket ground, and in private theatricals.
XIV. Tellicherry.	25. A detachment of native infantry garrisons this very picturesque station on the western coast. Low hills clothed with wood and interspersed with valleys approach to within a short distance of the sea, and its salubrious climate is generally acknowledged. The annual fall of rain averages from 120 to 140 inches; the soil is amazingly productive; the low lands yield three crops of rice annually, and on the higher ranges the culture of spices and coffee is rapidly extending. The men of the detachment are in excellent health.
XV. Cannanore.	26. The provinces of Malabar and Canara form part of the Mysore division of the army, and Cannanore is the head-quarter military cantonment. It has a seaport, which is embraced inland by a succession of low hills, composed of a gravelly laterite. On the edges of the cliffs along the sea face, which vary from 30 to 50 feet in height, the officers' houses are placed. A little inland, but fully under the influence of the pure sea breeze, are barracks for one European regiment, and still closer to the sea the regimental hospital is placed; these are commodious buildings, well elevated, and tolerably ventilated. There are quarters for three regiments of native infantry considerably to the north of the European barracks. The surface soil around and in cantonments is entirely composed of the debris of laterite, chiefly of a gravelly nature, forming a shallow covering to the rock itself. From the porous nature of this substratum, water is rapidly absorbed and drained off; the surface, even after heavy rain, speedily becomes dry, and there are no accumulations of stagnant water. The town is situated nearly a mile from the cantonment; it is very populous and very filthy. 27. To Europeans in health the climate of this station, after a lengthened residence, has a most relaxing effect. It is unfavourable to convalescence under all circumstances, and patients but slowly and imperfectly regain their wonted health and strength after an acute attack. The temperature is remarkably equable, the maximum being 88°, and the minimum 68° of Fahrenheit. The ordinary fall of rain is 120 inches, and it is not unusual for 6 inches to fall within the 24 hours. 28. Cannanore stands high in the scale of healthy stations for European troops within this Presidency. Cholera is rare, but diarrhœa and dysentery prevail. Taking a cycle of 15 years prior to 1856-57, the admissions into hospital from these diseases average 22 per cent. on a strength of 14,441. In 1857-58 the average was 19 per cent. on a strength of 722. But syphilitic affections are of all others the most prevalent amongst the European soldiers.† In the first of the above periods 3,666 are registered, or 25·3 per cent. on the strength, and in the second 213 or 29·5 per cent. of strength were treated, independent of a large percentage of rheumatic affections, concurrent on the primary syphilitic. But I will reserve my observations on this disease until I come to treat of it as it affects the army generally.
XVI. Mangalore.	29. Mangalore is the principal military and civil station in Canara. The native town stands in the immediate vicinity of the sea. The free circulation of air is here impeded by the dense wood and high walls which surround almost every little hut.‡ The ground occupied by the cantonment is undulating, with a gravelly laterite subsoil, resembling much in character that around Cannanore. Immediately beyond cantonment the hills rise to some elevation; at first rugged in aspect, and covered with bare jungle and scanty grass, but finally attaining considerable height. One portion, denominated the Kudray Mook (Horse's nose), attains an elevation of upwards of 4,000 feet, and is resorted to by Europeans during the hot months of March, April, and May. The burst of the south-west monsoon compels them to resort to the plains in June. Two native infantry regiments § garrison the cantonment of Mangalore; its climate does not differ from the other stations on the coast, having a relaxing and depressing influence on long residents.
XVII. Coimbatore.	30. Two companies of native infantry garrison this civil station, which is 20 miles from the foot of the ascent to the Neilgherry mountains. It is 1,480 feet above the level of the sea, and the climate is agreeable and healthy.
XVIII. Salem.	31. The civil station of Salem is garrisoned by a detachment of native infantry. The native town is placed in the lowest part of the district in a saucer-shaped valley. Fever, a prevailing disease throughout the district, is seldom absent from the town. Cholera also appears in epidemic forms. But of late considerable improvement in the sanitary condition of the place has been effected by the removal of surface filth and by judicious drainage.
XIX. Vellore.	32. A detail of European artillery and two regiments of native infantry compose the garrison of this military cantonment, which is 80 miles west of Madras. In close proximity to the station are several rough detached rocky hills, some attain an elevation of 2,000 feet, and are resorted to by the officers of the garrison during the hot season. The soil in the neigh-

*The European detachment is now quartered in the houses transformed into an excellent barrack. The situation is admirable, and the change in every respect a vast improvement.—P. G.

† I may observe here, that on my repeated representation, Government has now sanctioned lock hospitals being established at every station in the Madras Presidency occupied by European troops. Commanding officers have received authority to expel from a cantonment any women suspected of being diseased, who may refuse to submit to be examined.—P. G.

‡ The site of the cantonment has now been changed, on my recommendation, to a fine clear elevated spot, open to the sea and with the freest ventilation.—P. G.

§ To be reduced to one regiment N. I.—P. G.

Stations.	Replies.
XIX. Vellore—*cont.*	bourhood of Vellore is a rich dark brown mould, which is very luxuriant. Formerly this station was not surpassed in salubrity by any in the country, more especially to the native constitution; but it is not so now. Fever is never absent from the station, and cholera is too often endemic; the cause of this is the crowded and overgrown state of the cantonment. Within the last 20 years the population within the military limits has doubled without its area being increased; houses, and high walls, trees, and hedges, now obstruct the free circulation of air, and conceal much surface filth. The hospitals are very inferior, low, badly ventilated and situated.*
XX. Chittoor.	33. A small detachment of native troops garrison this civil station, which is 1,100 feet above the level of the sea, on the borders of the Mysore table land, and bears a good reputation for salubrity.
XXI. Arcot.	34. The military cantonment of Arcot, 70 miles from Madras, placed in an open bleak plain, with here and there inconsiderable bare hills of granite in a decaying state; the subsoil is a whitish gravel, with little or no vegetation for several miles, and no jungle whatever for many miles around. Formerly the force stationed at Arcot was one European and two native cavalry regiments; now it is unoccupied, save by European non-effectives and invalids, and by recruits, who are drafted there on arrival from England. This European infantry depôt occupies the buildings erected for the dragoons in former days. The hospital is a lofty well-aired building, but the construction of the other barracks is defective, and as regards site and aspect all sanitary considerations appear to have been overlooked at the period of their erection. In construction they are not sufficiently raised from the ground, and with one exception they are wanting in elevation, in width, and in ventilation; finally, the position they occupy is the most unsuited, sanitarily considered, that the country around affords. 35. The climate of Arcot is exceedingly oppressive and exhausting. I was stationed there for some years, and I have not in my military career experienced in myself or in my professional attendance on others equal nervous exhaustion and inability to exertion. Cholera of a low and fatal type is endemic in the native town, and when it extends to cantonment, the results are usually most disastrous. I have not in any other part of the Presidency seen a body of European soldiers look so bloodless and cachectic as at Arcot. The fresh recruit and the old soldier, whether in hospital or in barrack, wore the same wan look.† 36. Within comparatively recent times this station has been periodically scourged by cholera. Her Majesty's 13th Dragoons suffered most severely, losing many officers and men. The 25th K. O. B. in like manner were severely visited. The 1st Madras Fusiliers likewise suffered severely, and 18 months ago the depôt of European recruits was nearly decimated by the same disease. The neighbouring station of Arnee has an equally bad reputation, and has been finally abandoned as a military cantonment. These frequent visitations of this most destructive pestilence to the cantonment of Arcot, and its terrible ravages on the enfeebled constitutions of those who garrison it, are powerful reasons for the adoption of a system which is more likely to economize the life of the soldier on first entering on his career in India.
XXII. Poonamallee.	37. This depôt for recruits, time-expired men, unfits, and invalids of Her Majesty's regiments of the line, is 13 miles west of Madras. The cantonment is a little above the level of the sea, the land in the vicinity, though sandy, is much under rice cultivation. The climate is salubrious, and cholera has rarely visited the locality. The barracks for the accommodation of the men are the worst I have seen anywhere; they are almost level with the ground, the walls are only 10 feet high, and the pent tiled roof only five above this; the doors are solid, if closed no fresh air can enter, there is darkness within, and but litle egress for the foul air above. I found the men crowded to an intolerable extent. In the enclosed verandahs as well as in the body of the building, the men lay on boards and trestles, with barely space to pass between each other's beds. Their clothing and kit was placed over their heads, and they partook of their meals where they lay.‡ 38. The hospital is placed within the fort, and it is even a more objectionable building than the barracks. It is low in the roof; great buttresses have been raised at short distances, both outside and inside; the verandahs, and centre walls have been erected inside the sick wards to keep the building from tumbling down. This ward is only 16 feet in breadth, it slopes from the centre to the sides (probably from the sinking of the foundations) to such an extent that the legs of the sick man's cot at the head are obliged to be raised on bricks, so as to place them on a level with the floor on which the foot part rests. The building is utterly devoid of roof ventilation, and the space on which it stands is encircled by the fort walls, the houses attached to the hospital, and by a shallow ditch, overgrown with weeds at one season, and at another by an offensive swamp giving off mephitic exhalations. Heat apoplexy, diarrhœa, dysentery, and hepatitis, are the great diseases of the place. Here also are observed the destructive effects of syphilis on our European army, and the loss to the State consequent thereon. 39. If it be desirable to remove the infantry depôt for the local European army from Arcot to a more unobjectionable situation, humanity demands that the drafts from home for Her Majesty's regiments of the line serving in this Presidency, the sick and wounded, &c., should find also a more favourable locality than Poonamallee. I will reserve the consideration of this subject for a separate section.
XXIII. Palaveram.	40. This military cantonment is the chief depôt for all native sick details from regiments serving beyond sea and out of the Presidency. Atrophy, rheumatism, beriberi, and bowel disorders form the majority of the ailments of the men. The heat of Palaveram is great. But the station is reported healthy, and cholera seldom visits it.
XXIV. Saint Thomas' Mount.	41. The head quarters of the artillery arms of the Madras army occupy the military cantonment of Saint Thomas' Mount. It is only four miles in a direct line from the sea, and eight from Madras. The soil on which the cantonment stands is a red clay or gravel, and although the heat for six or eight months of the year is very oppressive, the station enjoys a favourable reputation for salubrity. The barracks are very good, the hospital is a

* The fort of Vellore is to be dismantled, and the station abandoned as a military quarter.—P. G.

† Government has now consented to withdraw the European Recruit Depôt from Arcot to the Mount, a measure urged by me three years ago.—P. G.

‡ This depot is also to be established at the Mount, and full time it is that Poonamalee should be abandoned; the public buildings of every kind are, I really believe, the worst in the world occupied by British soldiers.—P. G.

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STATIONS.	REPLIES.
XXIV. Saint Thomas' Mount—*cont.*	first-rate building, there are skittle sheds, fives court, and library for the use of the men.* The barracks are provided with punkahs, and during the hot land winds with other appliances to moderate the overpowering heat; yet cases of heat apoplexy are not unfrequent when the thermometer ascends beyond 95°. Fever assuming typhoid symptoms, with much gastric derangement, prevailed amongst the men from July to December 1857; and it is worthy of observation that fevers of this character are on the increase at some of our large military stations. Dysentery and liver complaints, and an unusually large number of venereal cases are the ordinary admissions into hospital at the Mount. Reckoning for a period of 16 years, or from 1842 to 1857-58, out of an aggregate strength of 21,458 Europeans who served within this, the centre division of the army, the following exhibits the admissions and deaths from the under-mentioned diseases:—

	Admissions.	Deaths.	Treated to Strength per Cent.	Deaths to Strength per Cent.
From dysentery and diarrhœa	4,933	250	54·16	0·21
„ rheumatism and venereal	5,800	42	0·18	0·8
„ cholera	335	191	2·12	0·13
„ fevers	4,460	50	77·14	0·10
„ hepatic affections	1,345	74	13· 9	0·10
„ thoracic diseases	1,291	22	16·40	1·6

In the year 1857-58 the number of fevers treated were 58·6 as compared to 19·8 for the 15 years peceding, that for 1859–60 being only 10·21 per cent. to strength.

XXV. MADRAS.

42. The European troops at the Presidency have quarters assigned to them in Fort Saint George. Although the mortality is not equal to what we find at other stations of the army, the number of non-effectives from sickness is fully as great. Until lately this was easily accounted for by the crowded state of the men's barracks, and the impure atmosphere around them, from bad drainage, improperly constructed privies, confined space, &c. Now all this is in process of being remedied. A large amount of additional accommodation has been secured to the men; ventilation is to be thoroughly considered; the drainage and the privies are undergoing great improvement; verandahs are being placed all round the barracks, and free admission will be given for the pure sea breeze to permeate all parts of the buildings. When all the improvements are carried out, it is calculated that the upper story of the barracks will accommodate 600 men, affording upwards of 1,200 cubic feet to each man, and the important principle of providing for constant change of air in each space will also receive attention. There will be equally spacious accommodation on the ground floor; but I would strongly urge that this portion of the building should never be occupied by the soldiers as sleeping apartments. From the level nature of the soil and the small rise of tide, the drainage of the fort at best can never be thoroughly controlled, and this alone is an insuperable objection to a large body of men sleeping on the lower basement. I would recommend that the lower rooms be set apart altogether for non-commissioned officers' quarters, orderly rooms, workshops, lavatories, refectories, &c., &c. The great sanitary defect in Madras is its very imperfect drainage, and the difficulty of remedying this defect. But the condition of the *fort* is being much improved in this respect. A plentiful supply of water is to be introduced, and raised sufficiently high to ensure complete flushing of the drains; the sea rampart has been lowered, and now admits the pure and refreshing sea breeze which prevails eight months of the year; and the present obstructed ventilation within will be rectified by the levelling of walls and buildings.

43. There is still one point, however, which calls for reform, namely, the quarters for the married men. A man with his wife and family occupy an apartment averaging 10 feet by 18, with walls 11 feet in height, having a low pent roof above, and the windows and doors opposite, so that a current is kept up in the small apartment, always a source of danger to health in India, but without which it would be unendurable as a residence. In short, these apartments are quite unsuited for Europeans in a tropical climate.† Prior to their conversion into married men's quarters they were used as stables for the officers of the garrison, partition walls being thrown up to separate them into rooms, and on an average five souls occupy each apartment, some of the females being marriageable. The building forms nearly a square, its dimensions being 50 yards by 70. It has two rows of buildings across its centre, and privies, bathing, and cook-rooms in close proximity. The square is under cover of the ramparts, and many of the dwellings are lower than the surface outside. On sanitary, moral, and social grounds, I may earnestly urge that more ample provision be made for the family men of the garrison, outside the fort, if there be found to be no accommodation within.

44. The sick of the regiment are now treated in the general hospital. This building is half a mile from the fort. In it are treated,—

1st. The sick of the European regiment of the garrison (usually 10 per cent. on the strength), and women and children of the regiment.

2nd. The sick of the European and Eurasian (male and female), of the public departments, of the shipping, and the community of Madras generally.

3rd. The sick of all denominations at the Presidency head-quarters attached to public departments, as below.‡

4th. The sick of detachments of troops, European and native, temporarily residing at Madras.

5th. European and native sick and wounded soldiers returning to the Presidency from service beyond sea.

45. The general hospital at Madras has long been a reproach to the Presidency. Erected as a Dutch factory 135 years ago, it is wanting in ventilation, drainage, and in conveniences of every sort, and it will be apparent from the above that there are too many elements at work to admit of the successful organization and administration of a purely regimental hospital

* Quarters for the married men were greatly wanted at the Mount, and have at last been sanctioned, and are now under construction. I applied for them four years ago.—P. G.

† The unsuitableness of these married quarters was brought prominently to notice four years ago, they have been improved since then, but to make them what they ought to be, they must be entirely rebuilt on a better plan.—P. G.

‡ Gunpowder Manufactory; Artillery Veteran Company; Time-expired and discharged men; Camp Equipage Department; Ordnance Department; Gun Carriage Manufactory; Commissariat Department; Quartermaster-General's Department; Pay Department; Engineer's Department; Public Works Department; Pension Establishment.

Stations.	Replies.
XXV. Madras—*cont.*.	within its walls. Extensive improvements are about to be carried out on the building, so as to meet the pressing wants of the place, and to render it more suitable for the sick. Advantage will be taken of this favourable opportunity to separate the two establishments, and thus put an end to the conflicting causes which mar the successful administration of both the general and regimental hospital discipline. The building is well situated, and exposed to the prevailing currents of air, and remote from permanent sources of malaria. In this neighbourhood a site might be secured for the erection of quarters for the married men of the regiment. 46. The European artillery of the garrison are quartered in low bomb-proof barracks under one of the bastions. They are of massive thickness, and double-casemated, with a narrow verandah in front, having cook-rooms and latrines in close proximity.* It is customary to call these quarters the coldest in the fort, and to be best liked by the men; but on what principle this is said it is difficult to understand. They are very low in the roof, badly ventilated, and cramped in on all sides. On lately inspecting them at 8 a.m., I found the men off duty, almost in a state of nudity, and the married men were bare to the waist, seated at breakfast with their wives and children; a fact which does not tend to substantiate the general opinion. It is well to have such secure quarters to resort to and afford protection to the garrison in case of siege, but certainly under ordinary circumstances they are not fit abodes for European soldiers. 47. The garrison of Fort Saint George is well supplied with good water, which is brought by pipes a distance of two miles. The extreme purity of the water in this direction is found to depend on a bed of sand in which the streams take their rise. The sand consists chiefly of quartz, and is perfectly white in colour. The extent of the bed is limited, and runs in a line south from the Pulicat Lake to the enclosure where the waterworks are placed, where it appears to terminate. The breadth of the bed in no place exceeds a few hundred yards. In some places it approaches the surface, but its usual depth varies from 10 to 15 feet beneath the surface. Should the bed of sand be passed in sinking wells, an inferior or brackish water is the result. 48. The native portion of the force quartered at Madras occupy lines at convenient localities in the neighbourhood. One set of these lines has been erected by Government, and are made over to each relieving regiment, an arrangement which answers admirably, and one which I should like to see adopted at every station of the army where native troops are quartered. Reckoning for a period of 16 years, or from 1842 to 1858, out of an aggregate strength of 16,065 European soldiers who served at the Presidency, the following exhibits the sickness and mortality from the under-mentioned diseases :—

Diseases.	Ad.	D.	Admissions.	Deaths.	Treated to Strength per Cent.	Deaths to Strength per Cent.
From dysentery and diarrhœa			3,079	119	20·23	0·14
„ rheumatism	1,681	3	5,484	6	72·19	0·02
„ venereal	3,803	3				
„ cholera			129	77	0·8	0·4
„ fevers			3,413	25	84·9	0·1
„ hepatic affections			1,202	42	8·9	0·5
„ thoracic diseases			1,203	69	14·7	0·7

XXVI. Bangalore.	49. The general aspect of the Mysore country is an undulating table land, varying in elevation from 600 to 3,269 feet above the level of the sea, interspersed with isolated hills, detached ranges, and continuous chains of mountains, some of considerable altitude. The rock forming the base of the whole country is of primitive formation; masses of granite, gneiss, and laterite, usually in vast rounded masses, rising above the table land. The general character of the surface soil is the black cotton, a rich red earth on the heights, and a clayey mould in the valleys. 50. Bangalore is the head quarter station within the division. The force garrisoning it consists of— European horse and foot artillery. 1 regiment of European cavalry. 1 regiment of native cavalry. 1 „ of European infantry. 3 „ of native infantry. The station is 3,000 feet above the sea, and 205 miles distant from Madras, to which it will ere long be connected by a railway. It is considered one of the finest climates in India. Many parts of the Mysore plateau are liable to severe visitations of epidemic fever, but at Bangalore these are almost unknown. The climate is particularly congenial to the European constitution. Disease can always be traced to imprudence in some shape, and convalescence is usually rapid. Thermometrical observations during a series of years afford the following results :— Annual mean temperature in the shade, 76° Fahrenheit. „ „ highest range, ditto, 81° „ „ „ lowest „ ditto, 69° „ „ „ variation in 24 hours, 10° „ 51. Until lately, the barracks at Bangalore for the accommodation of the Europeans of the garrison were very indifferent buildings, both as regards position and construction. Indeed, the beneficial effects of perhaps the finest climate in India were in a great measure lost to the soldier and his family, who laboured under the counterbalancing disadvantage of having to reside in perhaps the worst constructed barracks, and provided with the worst conservancy in India, although the site they occupied was elevated and capable of good drainage. 52. Now a vast and beneficial change for the better is already far advanced towards completion. Most spacious accommodation has already been erected for the artillery on an admirable spot. The hospital is the only building that remains an opprobrium to us here. It is deficient in elevation in basement and roof, in width and ventilation, in conveniences and arrangements, &c. It has in its close proximity the troop horse sick lines and the privy, kitchen, &c. The accommodation is also unsuited and inadequate to the wants of the establishment.

* The quarters are quite infamous.—P. G.

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STATIONS

XXVI. Bangalore—*cont.*

REPLIES.

53. Splendid barracks are in progress for the accommodation of Her Majesty's dragoon regiment, on the highest and airiest space in the vicinity of the cantonment. These will consist of eight blocks of buildings, each to accommodate 80 men, having four serjeants' quarters attached. Each man will have 144 square feet, or about 3,000 cubic feet of air. The blocks have terraced roofs; the dimensions of the centre wards are 240 ft. in length, 24 in breadth, and 24 in height. An inner verandah 12 feet in breadth runs along each side of these, which serves for a refectory, and beyond this is another verandah, 10 feet in breadth. Privies, urinals, lavatories, cook-houses, &c., will be conveniently situated to each block. The hospital will be constructed on the latest and most approved style. A portion of the buildings are now ready for occupation, but the entire range will not be completed under four years. It is to be hoped that the important matter of surface and deep drainage will not be overlooked, and that an adequate supply of water will be secured for the flushing of these.

54. As the dragoons are enabled to take possession of their barracks the European infantry will enter those now occupied by them. These, too, are being converted into admirable buildings; in fact, are nearly completed. They occupy a space gently sloping to the north, so that all surface water runs off. Formerly the floors were flush with the ground, and the walls did not exceed 12 feet in height. Now the basements are raised, and the walls ascend double their former height, judicious perflation and ventilation being secured throughout the building. Admirable married men's quarters are also lately constructed here. Improvements are also in progress in the hospital; its former contracted and cramped-up space, low basement and roof, rendered the building unwholesome and unendurable to the sick. As much money is now being expended on the building as would have raised a first-class hospital. The space has been extended, and the apartments for the sick are raised and ventilated; but it would have been far better to have rebuilt the new hospital from the foundation* than to have repaired the old structure. A separate hospital for women and children, commodious out-houses for stores, &c., which until now were within the already too contracted space allotted for the sick soldiers, are also to be erected.

55. Large numbers of European pensioners have resorted to Bangalore since the period when the restriction regarding their permanent place of residence has been withdrawn. Including families, their number now exceed 1,100. Plots of ground are secured by them, on which they erect comfortable cottages, and these have already extended into a clean-looking village of considerable extent. I may here state that during the mutiny in Bengal, when it was necessary to send from Madras every available European, these pensioners were all enrolled, and protected this very extensive cantonment. I take the liberty to urge, for the consideration of the Royal Commissioners, that liberal encouragement be held out to European pensioners to take up their abode here. It has been already shown that they are a stay to the State in trouble, and, were free grants of land given them for garden purposes,† they would in course of time produce fruit and vegetables sufficient to supply a ration to the European soldier residing at Madras as well as Bangalore.

56. Bangalore cannot be said to be a healthy station for the native soldier who has just come to reside there. Indeed the same remark is applicable to the whole of the Mysore plateau, so far as the native is concerned. They are prone to attacks of fever, more especially if they have come from beyond sea or from a coast station, and they do not become acclimatized under a residence of two years. During the year ending 30th April 1858, 102 per cent. were treated to strength, and the deaths have been 1·7 per cent. to strength. For the 15 years preceding the per-centage of sick has amounted to 78·3, and the deaths to 1·8 per cent. to strength.

57. Amongst the European troops the death rate during the year 1857–58 has been as low as 0·8 per cent. to strength. From 1842 to 1858, embracing a circle of 16 years, 26,517 soldiers served in the division. The following table exhibits the sickness and mortality amongst them from the under-mentioned diseases:—

Diseases.	Admissions.	Deaths.	Treated to Strength per Cent.	Deaths to Strength per Cent.
Fevers	1,403	53	30·11	0·21
Dysentery (Ad. 2,225, D. 117) / Diarrhœa (Ad. 1,705, D. 18)	3,930	135	33·2	34·12
Rheumatism (Ad. 2,589, D. 4) / Venereal (Ad. 9,092, D. 13)	11,681	17	96·23	3·06
Thoracic disease	359	157	1·6	0·6
Cholera	1,742	213	13·16	0·9
Hepatic disease	1,785	63	9·10	0·07

It has been observed that the force of disease is greater at Bangalore than at most other stations, especially amongst fresh arrivals, and children who have resided at stations having a much higher temperature. This is in most cases accounted for by carelessness in clothing, a subject which is now becoming better understood. Venereal disease is the great scourge to the soldier here, and in the phagedænic form, which it frequently assumes, it works terrible destruction.

58. The drainage of the cantonment is on the whole good. The extensive ridge it occupies slopes on the sides, and thus all surface filth is removed. But the greater body of this sewage passes into the tank or reservoir of water, which during the dry season affords a supply for not only the cattle of the force, but also to the dense native population.‡ There are also offensive open sewers running down these slopes, obstructed in their progress by walls or cross buildings. These, as well as the tank, emit most fœtid odours during the dry and hot weather.

* A new hospital would have cost over rupees 80,000, the improvement will be completed for from 10 to 15,000.—P. G.

† The whole of Mysore, even the ground on which stands the military cantonment of Bangalore, belongs to the Mysore Rajah, and the British Government cannot appropriate an acre of it without the consent of the Rajah.—P. G.

‡ Aye, and to the European population also. Every obstacle has been thrown in the way of procuring a copious supply of pure wholesome water, but it is hoped they are now in a fair way of being overcome.—P. G.

Stations.	Replies.
XXVII. French Rocks.	59. A regiment of native infantry garrisons this post in the Mysore country. It is five miles from Seringapatam, and was formed when sickness compelled us to abandon the latter city. There are occasional outbursts of fever at the station; but otherwise it is very healthy. Its elevation above the sea is 2,300 feet.
XXVIII. Mysore.	60. This, the capital of the Mysore country, and the seat of the Rajah, was temporarily occupied by European troops at the period of my visit there; but usually a detachment of native infantry only are stationed there. It is 2,513 feet above the level of the sea.
XXIX. Hoonsoor.	61. At this station are the great Government works for the preparation of all army accoutrements. The public cattle-breeding establishments are also placed here. It is garrisoned by a detachment of native soldiers, and does not enjoy a high reputation for salubrity. Fevers are endemic, and cholera not unfrequently scourges the town and district. Its elevation above the sea is 2,970 feet.
XXX. Mercara.	62. This military cantonment is the capital of the Coorg country, and has an elevation above the sea of 4,500 feet. The Bittatoor table land adjoining has a still higher elevation. These grand mountains take their rise abruptly from the Mysore country below, and consist chiefly of a succession of lofty narrow ridges, running parallel with each other in a north-westerly or south-easterly direction. In some parts the hills are gently rounded, and alternate with sloping glades clothed with forest. In other parts the hills are closer, more abrupt, and intersected with deep ravines, covered with low, impenetrable jungle, while in other parts there are a succession of beautiful grassy downs and clumps of trees, resembling park scenery in England. Vegetation everywhere is rich and luxuriant, and altogether the scenery is grand and picturesque. The Tadianamool mountain, 5,781 feet above the sea, is the highest in Coorg. There is considerable extent of table land on these hills, but they can never be converted into sanitaria as a residence for troops throughout the year, being too much under the influence of the south-west monsoon, which continues with little intermission for six months. European colonists are, however, rapidly settling amongst these beautiful mountains, and reside in localities which were heretofore considered uninhabitable from pestilential fevers. The felled virgin forest is destroyed by fire, a proceeding which to a great extent appears to carry away the malaria; and as no vegetation is permitted to obstruct the growth of the coffee, which takes the place of the forest, extensive tracts are thus becoming habitable. 63. The climate of Mercara is very equable. The maximum thermometer in the shade is 79°, and the minimum 52°, the mean being 66° of Fahrenheit. The average annual fall of rain is 160 inches; yet there are no swamps or accumulations of water, for the surface water rapidly drains off into the cultivated valleys which intersect the hills, and from thence into the running streams. The rainy season is considered the most salubrious, and, if the head be well protected from the sun, exercise can be taken in the open air at all seasons with impunity. Catarrhal affections and bowel disorders are the prevailing diseases.
XXXI. Jaulnah.	64. A considerable military station in his Highness the Nizam's territories, 659 miles north of Madras, and about 220 from the sea on the Bombay side. The cantonment is situated on a gently sloping declivity, having a small range of hills, about two miles distant, in front. The surrounding country is hilly, and much intersected by ravines. The geological formation of the hills is chiefly trap rock in a state of decomposition. The surface soil varies from a red gravel of a lateritious character, the ordinary black regur or cotton soil, or tracts of white stony land covered with long grass. The native towns of Jaulnah and Khaderabad are upwards of a mile from cantonment. The streets are narrow, but clean; the houses are tiled, and many of them are of superior construction. A small river forms the boundary of the military limits, and as the natural slope of the ground comprised within these is towards the river, the drainage of all parts of the cantonment is good. 65. The climate of Jaulnah is one of the most salubrious in Southern India. During the greater part of the year a fresh coolness is experienced in the mornings, although the heat of the day from March to June is intense, ranging from 90° to 100°. From July till October the rains prevail. The average annual fall does not exceed 32 inches. During September and October there is a partial cessation of rain. These are the most insalubrious months of the year, from the deleterious exhalations from the soil causing fever. Although the variations of temperature in the 24 hours during the four cold months comprised between November and February are great and sudden, the thermometer ranging between 40° and 80°, it is considered by European residents the perfection of climate, being strengthening and invigorating, and favourable to the health of the troops. 66. For many years the force comprising the garrison of Jaulnah consisted of— European artillery. 1 regiment of native cavalry. 2 „ „ infantry. Now it has been increased by the addition of a regiment of European infantry and a corresponding reduction in the native infantry. The military cantonment is in every respect well chosen, the barrack occupying a gentle acclivity. When I visited the place in company with his Excellency the Commander-in-Chief the greater part of the troops were on field service; but as his Excellency had resolved to strengthen the European portion of the garrison, an unexceptionably situated site was selected for the new barracks, on high ground in the neighbourhood, sloping gently towards ravines on every side, with which the drainage from the barracks could be conveyed with ease to a distance. The cantonment of Jaulnah stands first on the scale of sanitary stations for European troops within this Presidency. In a period of 10 years, from 1847 to 1856-57, the ratio per 1,000 of sick to strength treated was 2,368. The ratio of deaths from all diseases was 10·3, and of deaths from all diseases, excluding cholera, 9·3.
XXXII. Nagpore.	67. Embraces the greatest portion of that part of Central India called Berar. There is perhaps no great native city in India that can be compared to Nagpore in meanness in appearance, in the accumulation of masses of filth and garbage, in the numerous offensive cesspools and open ditches, and in the total absence of drainage and roads. The sickness and mortality in this receptacle of filth is said to be very great, but we have no means of arriving at any correct data on the subject.

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STATIONS.	REPLIES.
XXXII. Nagpore—*cont.*	68. *Seetabuldee* is a military cantonment in the neighbourhood. The entire British force at one time garrisoned this position, but proving unhealthy it was abandoned. Now it affords accommodation to the Nagpore irregular native force, the fortress only being occupied by a detachment of Europeans from the large military station of—

69. *Kamptee*, which is 722 miles from Madras, 733 from Calcutta, 577 from Bombay, and 10 miles eastward of the city of Nagpore. The cantonment occupies an extent of nearly six miles along the right or south bank of the broad river Kunnav. The soil is the common regur or black cotton, interspersed with calcareous nodules. The surrounding country for many miles is flat, destitute of wood, and intersected by ravines, being cultivated only in the cold and rainy seasons. The position occupied by this military cantonment was selected without regard to the most ordinary sanitary considerations; built on the bank of a broad river, the channel of which is exposed the greater part of the year; the ground is intersected by ravines, which during the rains carry down quantities of alluvial debris and swamp the cantonment, and when the rains cease these ravines become receptacles for filth. Thus the physical conditions requisite for the production of malaria are present while any moisture remains on the surface, and also when the streams dry up, in consequence of the abundance of surface filth which accumulates in the exposed channels, and the alternating influence of heat and moisture on this surface.

70. I visited this cantonment in company with his Excellency the Commander-in-Chief. Sir Patrick Grant was quite of opinion that, sanitarily considered, nothing could be worse than the position of the station. Kamptee has long been notorious for a severe form of fever, and until lately the opinion prevailed that the sole cause of this fever was the deleterious principle of malaria evolved from a dense tract of jungle about 20 miles distant. But abundant cause for the production of the malady is now allowed to exist in and around cantonment.

71. An extensive ridge runs to the north-west of cantonment, and slopes in the direction of the river. It is quite free from the objections above detailed, and both sanitary and military considerations (for his Excellency has favoured me with his views on this subject) mark it as the most desirable position for the location of troops. It is on the great road from Nagpore to Kamptee, and is of sufficient elevation to secure a pure atmosphere, excellent drainage, and safe from all that renders the atmosphere noxious on the banks of the river, while a plentiful supply of water can be secured by storing the streams as they descend from the neighbouring heights before coming in contact with the impurities in the low ground below. To extend the cantonment, therefore, as has been proposed, following the course of the Kunnav stream would be merely to perpetuate the evil originally made. I beg earnestly to urge that every opportunity be taken gradually to withdraw the cantonment from the banks of the river and extend it in the direction indicated by his Excellency, and thus while one flank would rest on the river the other would ascend to the high and wholesome position pointed out.

72. The transitions of climate are usually very regular at Kamptee. The cold weather continues from the middle of October till the middle of March; the hot season from this period till June, when the rains come on and continue until October. The diurnal changes of temperature necessitate great attention to the precautionary measure of appropriate clothing. The mean temperature during the cold months is 68°; the minimum known has been 36°, and the maximum 110° in the shade, but in the sun the thermometer has been observed to rise as high as 140° of Fahrenheit. The average fall of rain per annum is 40 inches.

73. The force now garrisoning Kamptee consists of—

1 regiment of native light cavalry.
1 troop European horse artillery.
2 comp. do. foot do.
1 regiment European infantry.
3 regiments of native infantry.

The barracks for the European soldier are deficient in ventilation, and are without verandahs to protect the inmates from the direct rays of the sun, which strike directly on the buildings, and are also reflected from a high whitewashed wall which surrounds them. His Excellency Sir Patrick Grant has urged on Government the immediate necessity of introducing proper ventilation; he has recommended that the roofs be raised, that each barrack be provided with a deep verandah, and that the very objectionable prison-like walls which surround the square be lowered and surmounted by a rail.

74. The position occupied by the married men of the European portion of the force is most objectionable. It is on the bottom of the ridge above referred to, and level with the river's bank; thus it not only becomes flooded during the rains, but remains a swamp for months afterwards, and finally dries up, leaving much surface filth exposed to the sun. The arrangement of the buildings is also objectionable; they occupy a contracted space close on the barrack wall, the cook-rooms and privies being so placed that free perflation is quite out of the question. His Excellency condemned the site and quarters *in toto*, and suggested remedies in which I most fully concur. The introduction of these I beg to express a hope the Royal Commissioners may use their influence to expedite.

75. The number of deaths at Kamptee from apoplexy in former years was enormous. For 10 years prior to 1838 they amounted to 73¾ per cent. of the sick treated. The large majority of these cases would now pass under the name of "Insolation" or "heat apoplexy." Very many still report sick from this cause, but the disease is now more amenable to treatment, partly because it is better understood and partly because the soldier has better accommodation, and more space is allotted to him in barracks than formerly. The following contrasts the death rate amongst the European portion of the force during the past 10 years as compared with that which obtained 20 years ago:—

From 1829 to 1839.		From 1849 to 1859.	
Aggregate strength	9,574	Aggregate strength	3,216
Do. admissions	2,309	Do. admissions	6,212
Do. deaths	377	Do. deaths	72
Average per-centage of deaths to treated	16·32	Average per-centage of deaths to treated	1·15

76. Fevers have also been another source of great mortality to the soldier at Kamptee, and although the aggregate number of admissions from the several types of this disease is smaller than that of former years, there is nevertheless an increase of the more grave forms of the malady, viz., the remittent with cerebral and hepatic determinations, and not unfre-

Stations.	Replies.
XXXII. Nagpore—*cont.*	quently typhoid characters supervening, indicating that the producing cause, whatever this may be, is more intense now than heretofore. The average sickness from all diseases for a period of 15 years, ending 1857, has been 199·9 per cent., while in 1858 the number was 189·6 per cent. The mortality in the former period was 3·7, and in the latter 4·0 per cent. The following table exhibits the sickness and mortality at the station for a period of 16 years from the under-mentioned diseases:—

Period from 1842 to 1857–8. Aggregate strength, 8,786.	Cholera.		Fevers.		Liver.		Diarrhœa.		Dysentery.		Thoracic.		Rheumatism.		Venereal.	
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
	71	37	6,161	84	731	29	1,212	26	1,096	58	252	11	1,050	6	1,425	4
Ratio of strength to sick per cent.	0·8		127·7		18·2		27·7		26·12		11·8		19·13		38·7	
Ratio of deaths to strength per cent.	0·4		0·17		0·7		0·3		1·6		1·14		0·7		0·0	

XXXIII. Secunderabad.

There is little to detail relative to the health of the native portion of the garrison. They reside in their own proper lines along with their families, and are subject in like manner with Europeans to the endemic disease of the station, viz., fever; but they are partial to the place, and, upon the whole, enjoy better health than at many other stations of the army.

77. This is the most extensive military station within the Presidency of Madras, and is garrisoned by a force as per note.* It is six miles from the vast native city of Hyderabad, with a population estimated at 200,000. This city is surrounded by a high stone wall covering an area of seven miles. It has narrow ill-paved streets, and so exceedingly foul and offensive that it may be said to be a focus for disease at all seasons of the year. The cantonment is 1,800 feet above the sea. The general surface of the country is irregular and undulating, the greatest elevation of the table land being at Beeder, about 60 miles north of cantonment. On the higher grounds the soil is silicious, with decaying trap and granite rocks in isolated and large masses interspersed on the surface. In the plains and hollows the soil is a rich black loam, producing luxuriant crops.

78. The seasons return with great regularity, and may be classed into the cold, from the middle of November to the middle of February, the hot from this period to the end of May, and the rains from the early part of June till the end of September. Although the heat is at times excessive, the mornings throughout the year are pleasantly cool. The mean temperature of each month is as follows:—

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
72	76	84	91	93	88	81	80	79	79	75	72

The average fall of rain per annum is 32 inches. The climate is considered as salubrious as any in India, and possesses a happy medium between the extremes of heat and cold experienced in the upper provinces of Hindostan. The maximum temperature reaches 110°; the minimum has been known down to freezing point. The daily range during the cold months varies from 20° to 30°. It is at this season that extreme caution is so necessary to protect the surface from sudden chills, which are so prone to engender visceral and hepatic derangements.

79. A residence of 14 years in the vicinity of this important military station, and a knowledge of almost every regiment which has visited it in that period, enables me to speak with some confidence on matters relating to hygienic details of the place. The military limits extend in a direct line east and west nearly five miles, one flank resting on an extensive tank, which irrigates a great extent of land running parallel with the station. There is a perpetual flow of water from this tank; what is not consumed in irrigation passes away by the natural drainage of the country, receiving in its course the sewage from the more elevated ground, from the native bazaars and European barracks, polluting the atmosphere in its progress, and finally becoming disembogued in the river a mile to the east of the barracks.

80. The entire area occupied by the cantonment is lower than the adjacent country, and the European infantry barracks are placed on the lowest part of this area. Masses of granite rock, bare from the base to the top and elevated ground, encircles the barracks themselves, except on one side in the direction of the tank. A superficial substratum of soil over rock tends to retain moisture and to make the space the focus of the surrounding drainage; the ground has thus become saturated with organic matter, and besides this there are two extensive grave-yards in close proximity to the buildings.

81. The barracks consist of a square of narrow, ill-ventilated, closely-packed ranges, and a detached range for the flank companies; close on one side of the square, in the direction of the prevailing winds, are privies and cook-rooms. A high prison-like wall surrounds the barracks, and the circulation of air within the enclosure is still further interrupted by blocks of buildings. The emanations from the earth, the fœtor from the privies and sewers, the imperfect perflation from the crowded buildings, and the vitiated atmosphere from the presence of a large body of men in far too circumscribed a space, has hitherto induced a morbific atmosphere, which rendered the soldier susceptible to disease on every change of the weather or other exciting cause.

82. I need not revert to the sad history of these barracks, and how regiment after regiment has been decimated within their walls. It is true that some seasons present a more favourable aspect than others, yet, taken as a whole, I think I am justified in asserting that a more unfortunate proof of the insalubrity of the position and structure of public buildings cannot

* 1 Regiment of European Cavalry.
1 Do. of Native do.
1 Troop European Horse Artillery.
2 Batteries and 2 Companies European Foot Artillery.
1 Company Sappers and Miners.
2 Regiments of European Infantry.
4 Do. of Native do.

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STATIONS.	REPLIES.
XXXIII. Secunderabad—*cont.*	be presented. Deputy Inspector-General of Hospitals, Dr. Innes, when in charge of Her Majesty's 4th King's Own regiment in 1843, stated, "that the most anxious attention has "failed to discover, and, if possible, obviate, the causes in which this *frightful* pestilence "(dysentery) has originated, but only negative results were obtained. The men in the "patcherry and barracks, those who performed light duty and those who did not, those "who occupied barrack rooms exposed to the monsoon or sheltered from it, those of tem-"perate or intemperate habits, all suffered alike." 83. The barracks have repeatedly been condemned by Military and Medical Committees, composed of gentlemen of high reputation; but the exigencies of the service rendering it necessary that they should still be occupied, enormous sums of money have been expended on their improvement, with apparently little benefit to the health of the soldier, if we may judge from the terrible outburst of dysentery which carried off 10 per cent. of the 1st Royal regiment of foot during the past year, 1858–59. 84. While the men in these barracks suffer so dreadfully, both the officers of the regiment and the other European residents in cantonment are exempted from the same grave form of disease. The European artillery also, stationed at a distance of a mile and a half from the barracks, suffer comparatively little, although nothing can be more objectionable, sanitarily considered, than the construction of their barracks, but occupying a high and healthy locality, the disease, when it does attack them, usually yields to treatment. 85. That this exemption is not an occasional or accidental one is shown by the subjoined Table, exhibiting in contrast the sanitary condition of the European troops occupying the artillery and infantry barracks from 1837 to 1858, a period of 22 years. The artillery, it will be observed, lost on an average $2\frac{6}{11}$ per cent., and the infantry 5·0 per cent.; and while the artillery had $5\frac{7}{11}$ per cent. constantly sick, the infantry had $7\frac{8}{11}$.

	European Artillery.					European Infantry.				
Years.	Average Strength.	Average Sick to Strength.	Total Admissions each Year.	Total Deaths each Year.	Proportion of Deaths to Strength.	Average Strength.	Average Sick to Strength.	Total Admissions each Year.	Total Deaths each Year.	Proportion of Deaths to Strength.
1837	$120\frac{8}{12}$	$9\frac{1}{2}$	258	5	$4\frac{1}{8}$	851	$9\frac{1}{8}$	1,463	125	$14\frac{11}{16}$
1838	$96\frac{10}{12}$	8	204	5	$5\frac{1}{4}$	$728\frac{1}{2}$	$9\frac{1}{3}$	1,316	52	$7\frac{1}{6}$
1839	$96\frac{6}{12}$	$5\frac{3}{4}$	162	6	$5\frac{3}{4}$	$630\frac{1}{4}$	$9\frac{1}{4}$	1,172	37	$5\frac{7}{8}$
1840	$104\frac{8}{12}$	$6\frac{1}{4}$	169	0	0	$604\frac{5}{12}$	9	1,256	32	$5\frac{1}{4}$
1841	$115\frac{9}{12}$	4	153	4	$3\frac{1}{3}$	$855\frac{9}{12}$	$7\frac{3}{4}$	1,859	33	$3\frac{7}{8}$
1842	$104\frac{4}{12}$	$3\frac{13}{16}$	116	2	$1\frac{7}{8}$	$945\frac{1}{2}$	$7\frac{1}{4}$	1,773	49	$5\frac{1}{6}$
1843	101	2	77	0	0	824	$9\frac{2}{3}$	1,608	90	$9\frac{1}{6}$
1844	93	$4\frac{1}{8}$	108	6	$6\frac{1}{2}$	904	$7\frac{3}{4}$	1,526	58	$6\frac{1}{2}$
1845	80	$3\frac{1}{8}$	75	0	0	1,008	$5\frac{1}{3}$	1,445	30	$2\frac{9}{10}$
1846	159	$7\frac{1}{8}$	128	6	$3\frac{2}{3}$	924	$8\frac{2}{3}$	1,790	62	$6\frac{2}{3}$
1847	149	$7\frac{1}{2}$	212	6	$4\frac{1}{6}$	1,052	$7\frac{1}{2}$	1,749	37	$3\frac{3}{5}$
1848	158	$6\frac{2}{5}$	253	2	$3\frac{1}{4}$	1,099	$6\frac{9}{11}$	1,633	29	$2\frac{4}{5}$
1849	179	$6\frac{1}{2}$	264	4	$2\frac{1}{4}$	431	$5\frac{1}{3}$	85	0	0
1850	170	$5\frac{1}{3}$	252	8	$4\frac{4}{5}$	980	6	1,663	22	$2\frac{1}{4}$
1851	176	4	188	1	$\frac{1}{2}$	988	$7\frac{2}{3}$	1,958	62	$6\frac{1}{4}$
1852	186	$5\frac{1}{2}$	248	5	$2\frac{2}{3}$	964	7	1,781	5	$\frac{1}{2}$
1853	150	$5\frac{1}{3}$	206	0	0	905	$7\frac{1}{3}$	1,580	12	$1\frac{1}{3}$
1854	84	6	128	2	$2\frac{1}{3}$	637	7	1,659	36	$5\frac{2}{3}$
1855	$115\frac{3}{4}$	$6\frac{1}{11}$	196	4	$3\frac{1}{2}$	852	$10\frac{1}{4}$	1,961	18	$2\frac{1}{9}$
1856	175	8	311	5	$2\frac{6}{7}$	812	$5\frac{3}{4}$	1,302	10	$1\frac{1}{5}$
1857	134	$6\frac{3}{4}$	243	2	$1\frac{1}{21}$	1,067	$3\frac{1}{2}$	1,753	20	$1\frac{9}{10}$
1858	95	$6\frac{1}{3}$	140	3	$3\frac{1}{6}$	1,186	$9\frac{2}{3}$	1,161	110	$10\frac{4}{5}$
Average	$131\frac{1}{2}$	$5\frac{7}{11}$	186	$3\frac{5}{11}$	$2\frac{6}{11}$	$888\frac{2}{11}$	$7\frac{8}{11}$	$1,523\frac{6}{11}$	42	5

The diseases which usually occasion this destruction to life amongst the European infantry soldiers are acute dysentery, of hœmorrhagic type, and hepatitis; and in some cases it runs its course in a few days. There is little premonitory warning; acute symptoms usher in the disease, and ulceration, sloughing, or hepatic abscess speedily supervene, rapidly destroying the patient.

86. The lines of some of the native portion of the garrison also occupy low and unwholesome localities, as compared with the more elevated ground around. The consequence is, that the average number of non-effectives from sickness exceeds what we usually find in native corps elsewhere. The types of disease which afflict them are fever and its concomitants, as well as bowel disorders, which speedily undermine the system and tend to increase the pension list.

87. In the formation of the cantonment of Secunderabad, therefore, I am compelled to admit that the importance of sanitary science, as bearing on the health and general well-being of troops, whether in the position of the buildings or their architectural structure, has not been sufficiently recognized. The skill of the medical man may relieve, but the removal of the cause must rest with the military authorities.

88. The extreme altitude of the cantonment above the sea, as has already been stated, is 1,800 feet. The positions occupied by the barracks, lines, and bazaar, average 100 feet under this. The height of the neighbouring table land, part of which is occupied by the artillery and part by the new infantry barracks, averages 1,900 feet above the sea, and the ground gradually rises from this for a distance of five miles north to a point where the watershed separates the drainage to the rivers Kistnah and Godavery, and here it attains an elevation of nearly 100 feet higher. His Excellency the Commander-in-Chief, in his recent tour to Secunderabad, personally devoted much consideration to the subject of the old cantonment, which has grown up to such enormous proportions that it covers an area of 20 miles, and necessitates a 10 mile march to some of the corps on an ordinary field day. I think I am correct in stating that, sanitarily and strategetically considered, he is of opinion that nothing could be more unsatisfactory than the present state of matters. Having made himself familiar with the high ground contiguous, he directed a mixed Military and Medical Committee to examine and report on its extent and capabilities. I was a member of the Committee,

Stations.	Replies.
XXXIII. ecunderabad—*cont.*	and we unanimously considered that the space is sufficiently ample for the transfer of all the troops scattered at present over so extensive a field; that as a military post it commanded all the country around; that a sufficient supply of water could be secured, and that, in a sanitary point of view, with judicious arrangements, such as the planting of trees and proper drainage, the site was in all respects admirable. The elevated ridge selected is about five miles in length and one in breadth. It possesses facilities for drainage on both sides, and is in all respects an incomparably better position for a military cantonment than the present locality. I beg respectfully to express my earnest hope that the influence of the Royal Commissioners may be exerted to expedite the views of the Committee, supported as they have been by the Commander-in-Chief.* 89. The new European barracks already occupies this elevated plain. There are 10 ranges for single men, one for each company, all freely ventilated, and calculated to afford a cubic space of 2,500 feet to each man. Serjeants' quarters are placed at the ends of the barracks, and on a gentle slope to the north of the buildings are admirable ranges for married men, each having a court-yard containing cook-room, bath-room, and privy; and the whole so arranged that each company has separate accommodation for single and married men. The hospital is a very superior building of two stories, and can accommodate 140 sick, affording 2,600 cubic feet of air to each man. Female and special wards, apothecaries and nurses apartments, store-rooms, bath-rooms, clothes-rooms, dispensary, and detached privies, communicating by a covered way, being also provided. In short, the whole is replete with every comfort, and are noble structures. 90. The cost of constructing these handsome buildings amounted to 135,000*l.*† Assuming that this money was borrowed at 5 per cent., it would yield 6,750*l.* per annum, or 18*l.* 9*s.* 10*d.* per diem. Taking, therefore, the cost of the barracks and family quarters, and supposing a complete regiment, 947 strong, is always quartered in these buildings, the lodging of each man would cost the State 4¾*d.*, or, if the families are considered in the calculation, the result would be, that each single man is lodged at an expense of 1¾*d.*, and each married man, with his wife (exclusive of children), at 3*d.* for a day of 24 hours, and this with every possible requirement for health, cleanliness, and recreation. 91. In a period of 16 years from 1842 to 1858, in an aggregate strength of 20,529 European troops who served with the Hyderabad subsidiary force, the following were the admissions and deaths from,—

Cholera.		Fevers.		Hepatic Affections.		Diarrhœa.		Dysentery.		Rheumatic Affections.		Venereal Affections.		Thoracic Affections.	
A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
125	50	7,585	56	1,707	91	2,048	32	4,210	297	1,768	16	6,711	9	1,193	41

XXXIV. Masulipatam.	92. A civil and military station on the coast, garrisoned by a regiment of native infantry under the officer commanding the northern division of the army. Formerly it formed the depôt for stores proceeding to the upper provinces; but difficulties connected with the port has caused it to be abandoned, and the depôt is now transferred to Coconada. The military cantonment occupies a sandy ridge, elevated a few feet above the sea. In spring tides much of the ground around is under water, and during the monsoon it is little better than a morass, but in the dry weather the swamp dries up by evaporation. A regiment of European infantry at one time garrisoned the fort, but the site has now become malarious in consequence of the low situation, the encroachments of the sea, the silting up of the fort ditch, and the impossible conservancy of the place from the enormous amount of surface filth kept in perpetual agitation by the ebb and flow of the tides, which caused fearful destruction of life and health in the ranks of the last European corps stationed there. Now the only Europeans sent to Masulipatam are a few invalids from Secunderabad, usually convalescents from visceral and hepatic disorders. Necessity alone compels the authorities to select this post for them, as being the nearest point to the coast. A temporary improvement is usually visible in the constitutions of the men, but there are frequent relapses; few of them become invigorated, and their recoveries are seldom enduring. Apart from the insalubrity of the site of the fort, the height of the barracks within, from floor to ceiling, is only 13 feet; the roofs are terraced, having no ventilation; the floors are barely raised above the ground; the windows are merely iron bars, with shutters folding inwards; the free access of air to the buildings is impeded by the high ramparts; and the drainage from the privies, &c., is obstructed beyond remedy by the accumulated mud in the ditch without. I have been thus particular in my description of the place in order to add my humble but earnest support to a measure urged by his Excellency the Commander-in-Chief, to establish a permanent communication by transit to the nearest point whence the invalid can be conveyed by water to Coconada, the newly established "*entrepôt*" for the upper provinces, and thence by water to Waltair, the recognized sea-coast sanitarium, and decidedly the healthiest spot along the Bay of Bengal.
XXXV. Guntoor.	93. Is a small civil station 40 miles from the sea, and garrisoned by a detachment of native invalid soldiers. The ground is flat and open to the coast, and, although the heat of the station be great, it is remarkable for its salubrity. The soil is black cotton.
XXXVI. Nellore.	94. This civil station stands on lateritious soil, and is distant 18 miles from the sea. The district is copiously irrigated, and produces large crops. A detachment of veterans garrison the place. The climate is very equable, but relaxing to the European constitution.
XXXVII. Bezwarra.	95. Great Government works have been in progress at this place for some years. A bund or "anicut" having been constructed across the Kistnah, with the view to direct the water of the river to diverge into canals on each side suitable for traffic and for the irrigation of the country. A detachment of Sappers and Miners form part of the workmen, and although the labourers amounted to many thousands, with the exception of accidents, there has been but little sickness.

* Remark by his Excellency the Commander-in-Chief. See my Inspection Tour Report of February 1859. Dr. Macpherson has described with perfect accuracy the conditions of the cantonment at Secunderabad.—P. G.

† Sixteen lacs was the cost.—P. G.

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STATIONS.	REPLIES.
XXXVIII. DOWLAISHWERAM.	96. Here also similar extensive Government works have been in progress since 1846, in building an "anicut" across the great river Godavery, in order to extend irrigation and afford the means of communication by water over a delta of many hundred square miles between this spot and the sea. The head-quarters of the Sapper corps are stationed here. Fever is prevalent, but otherwise the locality is healthy.
XXXIX. RAJAHMUNDRY.	97. A detachment of native infantry garrisons this civil station, which lies on the left bank of the river Godavery, a few miles above the last-named place. Amongst the natives syphilis prevails to a deplorable extent, but otherwise the character of the place stands high for salubrity.
XL. SAMULCOTTAH.	98. A station for a regiment of native infantry about six miles from the sea. The ground on which the cantonment stands has not been well selected. It is quite in a hollow, while high and dry ground is available in immediate proximity to the present site. Fever is endemic amongst the natives, but to Europeans the climate is genial.
XLI. COCONADA.	99. This seaport promises to become perhaps the most important in the Bay of Bengal. Already vessels of considerable tonnage pass up the river, and the channel is being dredged and deepened. It is now the port of communication for the transmission of stores to the stations of the Madras army in Central India, by means of the Godavery or the canals in communication with that river and the Kistnah. The town is still in its infancy, but it promises to become a place of considerable commercial magnitude. I beg to urge the necessity for the early introduction into this rising seaport of judicious sanitary rules, while the place is still unformed. Houses should be built with uniformity, and great attention should be paid to surface and deep drainage. Unless some code of regulations be laid down on this important subject, evils are certain to spring up hereafter which it will be difficult to remedy.
XLII. VIZAGAPATAM AND WALTAIR.	100. A force as per note * garrisons Vizagapatam and Waltair. The former is the native town and fort, and the latter the position occupied by the European portion of the force and officers. There is no comparison between the climates at both places. Vizagapatam is hot, confined, and insalubrious, while Waltair is the most pleasurable and genial to the European constitution of any other of our coast stations. The European veterans garrison Vizagapatam. Their hospital is quite unsuited for the purpose to which it is applied. It was not constructed for a hospital, and the whole of its internal arrangements bear testimony to this. Its site also is very objectionable. Immediately in rear of a tidal swamp, from which at certain hours of the day and night the most insupportable odours proceed. Patients in such a wretched building and unwholesome position cannot be expected to derive much benefit from medical treatment. The house has been rented by Government for 18 years, at rupees 64 per month. A sum therefore of rupees 13,824 has been expended on this worthless building. The native troops occupy a position one mile from Vizagapatam; they are very healthy; and two miles further on up the coast is Waltair. The Europeans stationed here are accommodated in temporary buildings, but it is in contemplation to erect permanent barracks for them, and also for invalids of the European force throughout the Madras Presidency, for whom a change to the sea-coast is recommended.† When I come to treat of sanitaria generally I shall have some further observations to make on the best means of extending the benefits of the sea-coast sanitaria to European invalids from all parts of India.
XLIII. VIZIANAGRUM.	101. A station for a brigade of native infantry and artillery, 40 miles north of Vizagapatam. A succession of ranges of mountains rise in close proximity to the station. On the more elevated of these a site has been fixed on for a sanitarium. But a deadly fever is the almost certain result of a night passed in the lower elevations. The climate of Vizianagrum from September to March enjoys a high reputation for salubrity. April, May, and June are intensely hot. The rains then usually fall, and moderate the excessive heat.
XLIV. CHICACOLE.	102. A regiment of native infantry garrisoned this civil station at the period of my visit to it; but it has since been withdrawn, and its place is taken by a detachment. Chicacole is four miles from the sea, and it enjoys a high reputation for salubrity.
XLV. RUSSELCONDAH.	103. This is the most western station in the northern division of the army, and is distant 50 miles from the sea. A regiment of native infantry garrison it. Immediately beyond the station high hills ascend and extend for miles, but none of them possess the elevation or other requisites which would attract European colonists. They are bare, dry, and very unhealthy. Fever is the prevailing disease at the station. The climate is intensely hot in the summer, but during the winter the cold is very piercing.
XLVI. CUTTACK.	104. Is the most northern military post for Madras troops on the coast, and distant only 230 miles from Calcutta. The station is very healthy. A regiment of native infantry and a company of native artillery form its garrison.
XLVII. BELLARY.	105. The head-quarters of the civil and military departments of the Ceded Districts has a garrison as per note.‡ The aspect of the country is flat, barren, and treeless. Numerous isolated bare granite hills are scattered over it, composed of large boulders, grotesquely heaped up in irregular masses. Most of the open country is a rich black regur soil, which returns rich crops when there is a sufficient fall of rain; but this is very uncertain. The fall of rain is less here than in any other part of India, and the country is subject to severe droughts. Large rivers intersect the district, and measures are now in progress to turn these streams to advantage, by diverting the water from them over the district for the purposes of irrigation and navigation.

* 1 Horse Battery Artillery.
2 Companies European Regiment.
1 Regiment of Native Infantry.
European Veteran Company.

† Sanction has been obtained for the erection of barracks at Waltair for a Regiment of European infantry, and two companies of artillery.—P. G.
Remark by his Excellency the Commander-in-Chief.
These buildings have been disallowed since the foregoing note was written, but I have again earnestly pressed upon attention the necessity of their being proceeded with.—P. G.

‡ 1 Regiment of Native Cavalry.
1 Troop of Horse Artillery.
1 Horse Field Battery.
1 Company of Foot Artillery.
1 European Regiment.
2 Regiments of Native Infantry.

Stations.	Replies.
XLVII. Bellary—*cont.*	106. The cantonment is 1,600 feet above the level of the sea. The characteristic peculiarity of the climate is the extreme dryness of the atmosphere, produced by the air passing over so vast an extent of bare surface. For two-thirds of the year the thermometer ranges from 88° to 100° in the shade, but during the winter months it falls to 50° of Fahrenheit. The station occupies about the most elevated spot in the district, and the ground slopes in all directions, so that no water lodges in the neighbourhood. The soil and the greater number of wells are strongly impregnated with muriate of soda and carbonate of lime; but in immediate proximity to these springs one of pure and excellent water is often found, ascribed to the almost vertical strata through which they rise. 107. Until recently the entire European force were accommodated in barracks within the fort; now the artillery alone occupy these, commodious and admirably constructed buildings having been erected on a high and dry plain for the European regiment. It is in contemplation to furnish the artillery with similar accommodation outside the fort,* and also to provide separate quarters for the married men, a measure which is very much needed. On the south side of the fort, about 100 yards from the ramparts, is a tank, which, when full, covers a circumference of about three miles; but from its extreme shallowness the water speedily subsides, and in its half-dried state noxious exhalations issue from it. The exposed bed of the tank is the place of resort for the natives for purposes of nature, and it also receives the refuse drainage from the bazaars. Add to this, some of the supply channels of the tank are overgrown with prickly pear, which conceals filth of every sort. Public latrines and other measures to secure a proper system of conservancy are much wanted at this locality. Cholera may be said to be endemic throughout the Bellary district, and when the malady visits the cantonment it is always found to begin and to end about this place. 108. The hospital now in course of erection for the sick of the European infantry is a magnificent building of two stories. It is calculated to accommodate 140 sick, besides women and children. In the construction of the building I fear that too much regard has been bestowed on appearances, and too little attention paid to the future comfort of the sick. My objections are— 1st. That, if carried out as explained to me by the Engineer officer in charge (who was directed not to swerve from the plan furnished to him), there will not be one spot in the entire building where the sick men can escape a current, for the only ingress for air is by the doors, and as there is no egress provided for the foul atmosphere generated within, save by these doors, some of them must remain open night as well as day.† 2nd. That much space is sacrificed in the inner apartments, by the introduction of spacious open arches in the wall separating this part of the building from the verandah beyond, and that the plan proposed of placing four beds around the circular pillars supporting the roof in the centre of the wards would be injurious to patients under the influence of sudorifics, or suffering from visceral disease, &c., from the constant current to which they would be exposed. In short, the great objections are, that while there is ample space and free admission of air, the means are wanting to guard against currents without checking the supply, and of providing for the ready escape of impure atmosphere generated within the building. 109. From 1842 to 1858, embracing a period of 16 years, the sickness and mortality from the under-mentioned diseases, in an aggregate strength of 10,969 Europeans who served within this division of the army, was as follows :—

Cholera.		Fevers.		Liver.		Diarrhœa.		Dysentery.		Thoracic.		Rheumatism.		Venereal.	
A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
467	201	3,816	21	776	26	969	14	698	38	551	17	1,565	3	4,249	2

XLVIII. Kurnool.	110. This military cantonment is garrisoned by a regiment of native infantry. The civil establishments of the districts are also located here. The force is chiefly quartered in a deserted fort built on a narrow tongue of land, which separates the confluence of the rivers Hindree and Toomboodra. The station is 900 feet above the sea, and the surface soil is a dark superficial mould, 10 to 20 inches in depth, lying on limestone and trap. As regards sanitary considerations, no position could be worse than the present for the habitation of man. The population of the city may be reckoned at 23,000, all being massed together in a contracted space within the fort, part of which is actually beneath the bed of the adjoining rivers. The officers of the force occupy houses constructed over the bastions of the fort, beneath and around whom, on every side, are the dense population, amongst whom fever, ophthalmia, small-pox, syphilis of a most malignant type, and sporadic cholera are always present; when the latter disease bursts, as it were, from its trammels, it works fearful destruction. The last outbreak (May and June 1859) carried off four Europeans out of the small community, 41 out of the regiment, and 2,000 out of the town. From the peculiarity of the soil above described, the interment of the dead is a very unsatisfactory operation; and the odour proceeding from the cemetery on such occasions is dreadful.‡ The European community have always graves prepared beforehand, ready to receive the first unfortunate victim to the disease which hovers around them. Beyond the immediate confines of this locality there are several positions, in a sanitary point of view free from objection, to which the military garrison might be transferred; especially one, north-east of the town, an elevated ridge of red soil, which his Excellency the Commander-in-Chief selected for the military cantonment.
XLIX. Cuddapah.	111. Has long maintained a bad reputation for salubrity. Hitherto it has been garrisoned by a regiment of native infantry; it is also the head-quarters of the civil establishments of the district. It is placed quite in a cup-like hollow, surrounded by mountains of moderate elevation. There is usually a still oppressive atmosphere within, and the heat is increased by radiation from the neighbouring hills. All this exercises an injurious influence on the

* Barracks for the artillery and married quarters, in the immediate neighbourhood of the European infantry barracks, have been sanctioned, but they are not likely to be completed for years yet from lack of funds.—P. G.

† The plan of the hospital was furnished from Calcutta, with strict injunctions not to deviate from it.—P. G.

‡ I have frequently recommended that Kurnool should be abandoned as a military station.—P. G.

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STATIONS.	REPLIES.
XLIX. Cuddapah—*cont.*	health of Europeans and natives. Fevers of a severe type are common, and recurring attacks frequent; and cholera is usually an annual visitant. The station is now abandoned as a military cantonment, it being garrisoned by a body of policemen.

112. I have now completed a short description of each civil and military station within the Madras Presidency, and I hope I may be pardoned for the occasional mention I have made of the name of his Excellency the Commander-in-Chief in these observations. Throughout a long and interesting tour made in company with him, his Excellency conferred freely with me on all points having reference to the health and well-being of the troops, and gave me constant opportunities of stating my views on such subjects with freedom. For this I am grateful, both on public and private grounds; and I here record my opinion, that occasional tours of this description on the part of the chief military authority, attended by a competent sanitary adviser, cannot fail greatly to advance the important ends which it is the business of Her Majesty's Sanitary Commissioners to promote.

MOUNTAIN AND SEA-COAST SANITARIA.

OBSERVATIONS on MOUNTAIN and SEA-COAST STATIONS and SANITARIA for EUROPEAN TROOPS. The beneficial EFFECTS of CHANGE to the EUROPEAN SOLDIER in HEALTH, or in CONVALESCENCE from SICKNESS. LOCALITIES suitable for HILL STATIONS, and SANITARIA within the MADRAS PRESIDENCY.

113. In the following remarks I propose to describe the special peculiarities and characteristic qualities which, in varying degrees, are common to all climates on mountain ranges, and on sea-coast sanitaria; their physiological and therapeutical effects on the animal frame; the general principles which should regulate their practical application to the prevention or treatment of disease, and the precautions necessary to be observed by those who resort to them.

114. With the view to obtain information on the comparative advantages and the physical characters of mountain ranges in general, and their respective merits as residences for Europeans in India, I have, in the course of my professional tours, availed myself of every opportunity personally to inspect the several localities about to be described, and also such other places as came within my reach, both in my own and in the other Presidencies. I may further state, that for many years past I have devoted much consideration to the important subject I am now about to enter on; and I solicit the indulgence of the Royal Commissioners if they consider that I have entered too much into detail on a matter which continues to engage much of my thoughts.

115. 1st. *Physical Characters of Hill Climates.*—If we examine the question of temperature of the hill climates in India the result is very satisfactory, both as regards their coolness and equability. Their mean annual out-door temperature in the shade varies according to elevation from 45° to 75° of Fahrenheit. Their mean daily variation in the 24 hours ranges from 10° to 20° in the open air, while within doors it hardly exceeds half this amount. Their distribution of temperature throughout the year are equally removed from excessive heat or rigorous cold; and they thus secure to us a temperate climate, congenial to the feelings and conducive to health.

116. The following table exhibits the mean temperature of each month, the average fall of rain, and the altitude of the mountain ranges already occupied or brought to notice in India:—

	Names of Hill Stations.		Mean Temperature outside in Shade.												Ascertained greatest Elevation.	Average Fall of Rain in Inches.
			January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
Bengal Presidency.	Darjeeling		40	41	51	55	61	62	63	64	63	55	50	44	8,000	132
	Simla		40	44	53	61	66	80	75	78	70	67	52	46	8,000	70
	Landour		35	40	51	—	—	—	—	68	64	49	46	46	7,300	—
	Murree		—	—	—	—	—	69	68	66	62	62	—	—	6,786	—
	Kussowlie		42	47	58	64	77	73	70	70	72	66	—	—	6,400	70
	Nynee Tal		42	46	56	61	69	69	67	69	65	61	50	47	6,200	83
	Dugshai		42	47	57	64	69	71	72	68	66	62	54	53	6,000	70
	Subathoo		—	—	—	77	81	84	79	77	—	—	—	—	4,000	70
Madras Presidency.	Ootacamund	Neilgherry range.	54	56	60	61	61	57	63	63	63	56	54	53	7,361	60
	Kotagherry	Neilgherry range.	59	60	61	63	63	64	65	65	64	62	60	59	6,100	55
	Wellington	Neilgherry range.	59	61	67	68	68	64	70	70	70	63	61	60	5,840	50
	Coonoor	Neilgherry range.	60	62	68	68	68	65	70	70	70	65	62	62	5,161	50
	Pulneys		51	53	60	61	—	—	—	—	—	—	—	—	7,000	—
	Mercara		53	56	61	64	44	66	65	65	64	65	63	56	4,500	100
	Annamullays		—	—	—	—	—	—	—	—	66	56	—	—	6,800	—
	Shevaroys		65	65	68	71	71	68	68	68	67	66	66	65	5,260	40
	Ramandroog		70	76	80	80	75	73	71	70	70	71	71	67	3,400	46
	Checuldah		60	60	70	83	83	71	—	—	—	—	71	71	3,600	—
	Sindwarrah	An average of 8° lower than the station of Kamptee.														
	Muthoor	Do. 11° do. do.														
Bombay Presidency.	Mahableshwur		63	65	72	74	72	67	63	64	64	66	64	63	4,700	240
	Poorandhur		67	73	77	78	73	70	67	65	67	71	69	64	4,200	73
	Mount Aboo		61	61	79	77	77	77	69	69	69	69	69	71	4,015	79

The mean annual temperature of the south-west of France is 58°2.
Ditto ditto south-east of France 58°8.
Ditto ditto Italy - - 59°6.
Ditto ditto Cape of Good Hope - 63°5.
Ditto ditto Madeira - - 64°5.
Ditto ditto Mediterranean - 67°5.
And the computed mean temperature of the globe is - - 67°.

STATIONS.	REPLIES.
Mountain and Sea-coast Sanitaria—*cont.*	Thus it will be observed that within the range of climate indicated in the above table is to be found the estimated mean temperature of the globe, as well as the mean annual heat of the most temperate and healthy climates both in the northern and southern hemispheres.
	117. There is an unequal amount of atmospheric humidity on most hill ranges. On the occupied spots of the Neilgherry plateau, during the rains, there are fogs and occasional heavy falls of rain. At Darjeeling the rains are almost unabated, and the damp excessive. So at Mahableshwur, there the constant down-pours and excessive dampness render these hills uninhabitable for several months every year. During the dry months, on inland hill stations, the rapid cutaneous evaporation, produced by the rarified atmosphere, conveys unpleasant sensations unless brisk exercise be taken; but on elevated ranges, within the influence of the sea breeze, an agreeable softness is communicated to the atmosphere, which being thus equalized, the unpleasant dryness is no longer perceived. This is very perceptible on the Pulney range, which is fully within reach of the sea breeze, both from the Cochin and Tutacorin coasts.
	118. The most important character of a hill climate is the great rarity and lightness of the air, caused by a reduction of the superincumbent pressure, which secures the advantages of a cooler and more elastic, a thinner and more agitated, a purer and more bracing atmosphere than that of the plain below. Thus malaria is rarely met with on these elevated situations, unless generated by defective conservancy on the plateaus of the hills themselves. The thermometer falls one degree for every 200 feet of elevation; the range of temperature attains its minimum at an altitude of between 3,500 and 5,000 feet, and increases at inferior as well as superior situations.
Physiological Effects of Hill Climates.	119. 2nd. I would class mountain climates within the tropics under three distinct heads: *a.* The tonic and soothing, to embrace all elevations below 5,500 feet above sea level. *b.* The tonic and invigorating, to include all ranges from 3,500 to 6,000 feet above the sea. And, *c.* The tonic and exciting, embracing all elevations exceeding 6,000 feet above the marine level. It is a popular belief that the temperature under direct exposure to the sun's rays increases with elevation, but my observations do not enable me to corroborate this.
	120. The action of a hill climate on the European constitution is two-fold; one, the effect of atmospheric temperature, the other, the result of atmospheric pressure. The first effects experienced on a transition from the low country to a hill station by a healthy person, or by an invalid whose system has become debilitated or relaxed by climate, is an increase of appetite, an improvement in the digestive and assimilative functions, an increase of muscular vigor and mental energy. These are the usual invigorating results of a change from a high to a reduced temperature—from a low to an elevated altitude; but in rare instances a great degree of excited action is produced on the vascular system, which in certain conditions, according to circumstances, either aids the tonic influence of the climate, or produces undue vascular excitement, and may derange the balance of the circulation, and induce local plethora. But by proper precautions the system in due time harmonizes with the climate, and these unpleasant effects pass off.
Therapeutical Effects of Hill Climates.	121. 3rd. As an auxiliary agent in the treatment of particular diseases, the hill climates of India exercise a powerful effect. They are of acknowledged value in all functional diseases, as, *a.* Intermittent fevers. *b.* Convalescence from remittent fevers. *c.* Functional disorders of the digestive organs. *d.* Constitutional debility, the result of natural delicacy of constitution or tedious convalescence. *e.* Diarrhœa, dependent on a cachectic or strumous diathesis, unconnected with organic lesion of the intestinal tissues. *f.* Functional hepatic affections, characterized by a torpid action of the secretory function of the liver, or by an irregular or disordered biliary secretion. This class of disorders, which are aggravated by hot seasons in the plains, will, under proper precautions as regards clothing, food, exercise, &c., result in a cool hill station in warding off the exacerbation which would otherwise have been experienced below, and tend to a permanent improvement in the general health. *g.* Incipient phthisis. Although a tropical mountain climate is contra-indicated in the latter stages of pulmonary phthisis, the fact is indisputably established, that it is productive of marked benefit in the incipient stages of the disease, more especially during the hot months. According to Dr. Lombard, the disease is "very frequent" at elevations varying from 1,600 to 1,700 feet above sea level. It is "exceedingly rare" at the height of between 4,000 and 5,000 feet, and "entirely disappears" at an elevation of between 6,000 and 7,000 feet. *h.* Strumous and cachectic affections, especially applicable in cases of young persons of delicate constitution who are born and reared in India, and to those who come to India before their growth has been completed or their constitutions matured. *i.* Nervous and periodical headaches, unconnected with general or cerebral plethora, with organic disease or rheumatic diathesis. *k.* Diseases of infancy and childhood. There are few diseases incidental to childhood in India that do not derive benefit from a residence in a hill climate.
	122. The diseases in which a tropical hill climate are inapplicable or injurious are organic visceral affections, the result of non-inflammatory alteration of structure, or of pre-existing inflammation, whether seated in the brain, heart, lungs, liver, or spleen. A residence on the sea coast, or at salubrious localities within the softening and refreshing influence of the sea breeze, a sea voyage, or an extra-tropical climate, constitute the only safe and efficient remedy for this numerous and important class of visceral diseases which affect the European soldier in India to a large extent. For such persons a rapid change to the coast is especially desirable. It is attended with striking benefit, and should always be had recourse to. When convalescence has been thoroughly established, a change to hill stations, such as the Pulneys, which are fully under the influence of the sea breeze, would have a marked beneficial effect in restoring them again to health.

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STATIONS.	REPLIES.
Mountain and Sea-coast Sanitaria—*cont.* *Precautions to be observed at Hill Stations.*	123. 4th. Vascular excitement and visceral plethora are experienced by all, more or less, on first attaining an elevated mountain range. This, exerted on a system already excited on first arrival, aided by an increased appetite, renders necessary the adoption of precautions, principally in reference to clothing, exposure, diet, and exercise, in order to counteract any injurious influence that might arise from a climate differing so materially in its constitution from that to which the individual had been habituated. This is themore necessary when the climate is resorted to simply as an auxiliary agent to aid the operation of other remedies in the cure of disease. Vigorous and robust individuals can scarcely use too much or too active exercise. But the invalid whose constitutional energies are below the healthy standard must be careful not to induce undue excitement or fatigue, and always bear in mind that however cool and agreeable the temperature may be, they are still under the influence of a vertical sun, and surrounded by an atmosphere whose rarity admits of more free and unobstructed passage to the solar rays. Clothing suitable to the climate should always be kept in store on hill stations resorted to by troops, to be issued to them on arrival, and deposited in store for the use of the relieving force when they descend into the plains. I have observed convalescents sent to the hills for the benefit of their health, going about in white cotton costume, when the temperature was so low that a woollen dress was barely sufficient to retain the animal heat of the frame without brisk exercise.
Acclimatization of European Troops and Prophylactic Effects of Hill Climates.	124. 5th. There is no climate in the habitable world which is not open to some valid objection, yet in the choice of a residence, with the view to prevent or to mitigate disease, there are governing principles to guide and direct us, viz., the constitution of the individual, and the nature of the malady he labours under. 125. Sir Patrick Grant, in a Minute to Government on the subject of establishing convalescent depôts on hill ranges for European soldiers, states that a searching investigation in the Bengal Presidency, by a committee of highly experienced medical and military officers, established the fact that the ratio of mortality amongst them was fully 50 per cent. less on the hills than it had been in the plains. That very experienced officer, Sir Mark Cubbon, Commissioner of Mysore, who has much personal knowledge of the climates of India, fully concurs with me in the superior advantages of hill stations as a prophylactic remedy; and, further, I have his authority for stating that a general belief prevails amongst all classes of natives of India, that until our European soldiers are in military occupation of our chief mountain ranges, our possession of the country is not secure. 126. Let us now inquire, in how far can hill climates be made generally useful as auxiliary agents for the preservation of health and for the prevention of disease. 127. In deciding upon the proper stations for European troops in India, there are two material points for consideration which may be sometimes opposed to each other, but which it is necessary as far as possible to reconcile, namely, the military, or strategical, and the sanitary. That they are sometimes antagonistic arises from the fact that there are many places upon the plains which it is necessary to hold, at the same time that the climate there is injurious to the health of Europeans. The question to be decided, then, is, how far can we take advantage of the healthy hill ranges existing in various districts, upon which to concentrate our Europeans, without weakening our military provisions? and this in a great degree depends upon the geographical position of the hills, and upon the means of rapid communication into the plains. 128. Before entering into this question, there is one erroneous idea which appears to be entertained by many persons, which it is necessary to dispose of. It is the notion that troops which are quartered in the plains gradually get accustomed to the heat, in fact, become acclimatized, and that therefore the hill stations need only be had recourse to as sanitaria, for places of recovery for sick and delicate soldiers. With regard to the supposed acclimatization, it is to be feared there is little in it. Doubtless many soldiers who come to this country young have acquired prudence by experience, and as their constitutions gain strength by maturity present, as a body, a fine, soldierlike, healthy, appearance. Acclimatization does a little, perhaps, in that way; but in looking at a regiment which has gone through the ordeal of a long residence in the plains, we must, in order to form a right conclusion, ascertain how many of the young, the delicate, the unformed, and possibly reckless youths that were in the ranks, have disappeared, either by death or invaliding. The men we see may be strong, but they are but exceptions; a few hundreds, perhaps, remaining out of thousands, who in a few years have been taken away. But our argument will go much further. There is very good reason for supposing that these very men who look so strong, and who are supposed to be accustomed to the climate, do not and cannot bear the heat as well as a regiment of the same age, and whose other conditions are the same, except that they have not been in a tropical climate. 129. It is of great importance to ascertain this latter fact, because if the supposed acclimatization is a fallacy, if the regiments who are quartered in the plains begin to weaken and to deteriorate in physical condition day by day, gradually but surely, from the beginning, it forms a very strong argument in favour of the necessity of concentrating our European forces, to the extreme limits of military safety, upon the healthy hill ranges; and even if the hill stations have to be established at some distance from the main roads and communications of the country, it would be well worth while for Government to go to some expense in bringing them into contact by branch roads or railways, so as to enable the Europeans to live in a genial climate, with the power of moving at once to any threatened points of disturbance. If every soldier landed in India cost 100*l.*, it is not difficult to perceive that it is good policy to keep him alive, independent of considerations of humanity. The pecuniary saving to the state would speedily repay the expense of a railway to the foot of the hills. 130. On the subject of acclimation, Sir Ranald Martin, F.R.S., gave evidence before the Royal Commission for the Re-organization of the Army as follows:—"The whole range of service in the plains of India is to the British soldier one unbroken course of physical degradation." * * * "A few years of residence in the hot and pestilential plains of India being of itself sufficient to spoil the blood and tissues of the European." Speaking of the necessity of removing the European troops to the mountain ranges, he says:—"It is impossible to overrate the importance of this measure, whether we regard the health and efficiency of the British army in India, its power to garrison and maintain the empire, or the capability of England, by voluntary enlistment, to fill up the muster rolls." He adds, "The eventual saving would be enormous." In answer to another question, he

STATIONS.	REPLIES.
Mountain and Sea-coast Sanitaria—*cont.*	says:—"That the ratio of mortality increases in proportion to the length of residence in India, steadily and certainly." Again he says, "That all the formidable diseases of India are essentially diseases of the plains." Sir Alexander Tulloch produces returns to the Royal Commission to prove that the ratio of mortality steadily and rapidly increases with the age of the men, year by year, in India. In Madras he says the soldiers die annually at the rate of— 26 per 1,000 between 18 and 25 years of age. 59 per 1,000 „ 25 and 33 „ 70 per 1,000 „ 33 and 40 „ 86 per 1,000 „ 40 and 50 „ 131. Again, if young Europeans of delicate constitution who come to India as recruits, at the early age of between 16 and 18, before their growth has been completed, or their constitutions matured, be sent to a station in the plains within the first or second year of their arrival, while they are growing rapidly, they become pale, sickly, and emaciated, they are liable to a variety and succession of ailments which though individually of little severity, tend, by their combination and succession, seriously to impair the constitution and lay the seeds for future disease. Let such persons repair to a mountain station for two years, their constitution will then become matured and consolidated, and sufficiently seasoned to undertake a much larger amount of fatigue duty on the plains than it would otherwise have been.
Hill Stations suitable for European Troops contiguous to the chief Military Posts.	132. 6th. It being, then, an established fact that in point of health a residence on mountain ranges is highly desirable for European soldiers, let us now endeavour to ascertain how far this principle can be practically adopted in the Madras Presidency. 133. As a general rule, the whole of the lower part of the peninsula held by the Madras army, south of the Kistnah and the Toomboodra, is in a complete state of subjection. There may be races of men in some parts of a turbulent character, but there is not one district whose inhabitants have military organization or means of aggression, and who, therefore, require the constant display of any large controlling force in the plains. 134. With regard to disposition of the forces generally, we find that the Commander-in-Chief, Sir Patrick Grant, has over and over again recommended the withdrawal of the numerous small detachments hitherto scattered about the country, and their concentration at a few central points. Economy, efficiency, and discipline would all be promoted by such a plan. The Military Finance Commissioners, in their report just printed, strongly advocate the same on economical grounds. Medical men would only urge, in addition, that the concentration be effected upon healthy localities. 135. The principal stations for European troops in the plains of this Presidency are Madras, Trichinopoly, Cannanore, Bellary, Vizagapatam, Secunderabad, and Nagpore. Contiguous to all of these, except Secunderabad, are easily accessible healthy hill ranges which secure a genial climate at all seasons to the European soldier. It would almost appear that an overruling Providence had specially provided the means of imparting vigor to the constitutions of the people of our nation, hitherto so highly favoured by Him, who are destined, we hope, to introduce a higher civilization into this land.
I. THE SHEVAROY HILLS.	136. *Madras*, as the capital and seat of Government, containing also an arsenal and manufactories for the material of war, will always require a certain proportion of Europeans as a garrison. If good barracks close to the sea were provided for this force, there seems no reason, when railways and other communications are completed, why the head-quarters of artillery and the depôt of Queen's troops at present stationed on those hot plains should not be moved altogether to a cooler climate, as Bangalore. 137. The Shevaroy Hills are now skirted by the railway which passes across the continent. Troops leaving Madras by rail at 4 p.m. would be able to breakfast at an elevation of nearly 5,000 feet above the sea the following morning. These hills form one boundary of the Salem valley, their greatest altitude is 5,200 feet above the sea, that of Yercand the position on which the European community have erected their residencies is 4,500. Here the surface is broken, rocky, and jungly, and it has been subject to occasional severe visitations of fever, either from inattention to sanitary requirements or to the failure of the regular monsoon. But these visitations are of rare occurrence, the type of the fever is as much under control as that which is usually found to prevail all over our plains, and deaths are rare. The present situation I assert is not well chosen, and no troops should be placed there. The position for a military cantonment ought to be the "Green Hills," five miles west from Yercand. Here the villagers appear to be in the most robust health; the ground is regularly cultivated; there is an abundant supply of good water throughout the year, there is a beautiful plateau of about 200 acres of undulating grass land, and the jungle has entirely disappeared long before this position has been reached. Indeed it is hardly possible to meet with a more desirable site for a military cantonment, having also abundant space in the neighbourhood for a parade. 138. Nothing can be more delightful to the feelings than the climate throughout the year. But from the property acquired by the residents on their ill-chosen position, they cling to the locality rather than abandon it to take up their residence on a more salubrious site. There are now 104 Europeans and East Indians (54 adults and 50 children) resident on these hills; some of these have not been on the plains for years, and the family of a missionary has been almost constantly on them for 18 years. One cannot but be struck with the healthy rosy complexion of the European ladies and children residing on these hills, to whose constitution the climate is peculiarly adapted. 139. It would be of infinite advantage to the anæmic European soldier stationed at Madras and its neighbourhood, if military considerations would admit of a portion of them being always located on the summit of these mountains, so as to permit an interchange of a portion of the force from the plains to the hills, and *vice versâ*, at certain periods, irrespective of health or sickness. The experiment as regards these hills, which are certainly subject to fever on the lower elevations, might in the first instance be tried on a small scale. Their proximity to Madras makes them valuable, and it is not probable that fever exists *per se* at an elevation approaching to 5,000 feet on grass hills devoid of jungle. 140. Ten per cent. is the usual sick in European regiments garrisoning Fort Saint George, and the majority of these come into hospital from fever. People have been accustomed to this

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STATIONS.	REPLIES.
I. The Shevaroy Hills—*cont.*	state of matters so long, that it ceases to excite surprise. But if the natural remedy of restoring to an elevated range with the view to vivify the anæmic and bloodless soldier and render him less liable to disease be proposed, there are not wanting men of sound judgment who join in the cry to condemn the locality, because of an occasional outburst of fever, forgetting altogether that the soldier is far more liable to fever and its concomitants and a host of other disorders besides at the station he is garrisoning. That in the one case he is equal to any emergency, and up to any amount of fatigue, but in the other he is so enfeebled by climate, so prone to imbibe disease, that he speedily breaks down on his first march from exposure, or succumbs to his first attack of illness. 141. In attendance on the Right Honourable Lord Harris I visited the Shevaroy Hills, when his Lordship drew up the following Minute, dated Salem, 12th July 1858. "I have now had the opportunity of visiting the locality on the Shevaroy Hills mentioned in my Minute of the 29th ultimo, and pointed out by Dr. Macpherson as a suitable site for the depôts of Her Majesty's and the Honourable Company's European recruits. "I have no hesitation in giving a favourable opinion of the place, so far as to recommend that the subject be taken into immediate consideration by Government. "The advantages of the position are numerous, 1st, it is within easy access from Madras. Troops might be landed there in the afternoon, and travelling through the night, could be brought to the cantonment by 8 or 9 o'clock next morning. "2. The ground appears well adapted for the purpose, and a considerable space could be obtained without difficulty. "Dr. Macpherson mentions 100 acres, but 200 or 300 could, I should think, be procured. "3. The climate is very agreeable, and the temperature particularly equable, a great desideratum for persons just arrived in the tropics. During the four days of my residence, 8th, 9th, 10th, and 11th, the thermometer did not range in the house above 71°. "4. The water is good and abundant. "5. The soil, subsoil, and underlying rock, specimens of which were procured for me, were considered satisfactory. "6. The height above the sea about 4,600 feet. "But all these points require to be more fully weighed, inasmuch as the climate the Shevaroys has obtained some degree of disrepute. "There is no doubt that the inhabitants, European and natives, were attacked by a very severe fever in the years 1824 and 1854, and I have heard it stated that slight attacks of a similar kind, but much slighter in degree, were experienced in 1834 and 1844, and were it probable that a recurrence of such a malady were to be anticipated, serious doubts might fairly be entertained of the advisability of making any attempt of the nature proposed. "I cannot, however, think that there is any serious objection in this case, maladies of one sort or another will periodically appear in all situations, but they may generally be greatly modified, if not altogether prevented by precautionary measures. "I cannot but think that the Shevaroy Hills would prove most beneficial for a depôt for the families of European regiments on service. "The children of the residents at Yercand enjoy perfect health, and their general appearance, bright colour, and vigorous bodies, lead to a most favorable impression of the climate. "It might be advisable to make a trial in the first instance on a small scale without going to any great expense, but on such a plan as could be enlarged on at pleasure." 142. In the month of February succeeding, his Excellency the Commander-in-Chief to whom my report on the hills and the Minute above quoted were referred, replied to Government through the channel of the Quartermaster-General as follows:—"I am directed by his Excellency to refer to my letter of 2nd September last, in the latter part of which Sir Patrick Grant recommends that a trial may be given to the Shevaroys as a station for invalids and time-expired men ordered for Europe, and for the families of corps absent on foreign service, a course his Excellency is still of opinion may be adopted." 143. The railway is about to be opened to the foot of these hills. Ere long, therefore, this delightful locality will be brought within nine hours of Madras, so that the recruit on his arrival from England may land at the railway terminus in the afternoon and breakfast on the hills the following morning. The arrangement which at present obtains is to transport both him and the invalid whose constitution has been shattered on the plains, or from wounds or hard service, to Poonamallee or to Arcot, two of our most enervating stations in the Carnatic, and having the worst barracks in the Presidency. (Vide marginal note by his Excellency the Commander-in-Chief, paragraph 37).
II. THE PULNEY HILLS. *Topography.*	144. *Trichinopoly*, as has been shown, is the head-quarters of the southern division of the army, and has a considerable European garrison, for whom new barracks are required. It is about the hottest and most debilitating climate in Southern India. The Pulney Hills range from 10° 10′ to 10° 44′ lat., and 76° 21′ to 77° 22′ long., and are under 100 miles from Trichinopoly. The superficial area of the hills is calculated at 800 square miles, their length from east to west is 64 miles, their medium breadth 15 miles, and the elevation of the plateau varies from 6,000 to 7,000 feet above the surrounding plains, and they are 6,000 to 8,000 feet above the sea. 145. The hills are divided into two distinct portions, the Mel or Western, and the Kel or Eastern ranges. The greatest elevation of table land is towards the west, and it drops in distinct plateaus eastwards at intervals of 1,500, 1,000, and 500 feet, until the plains are reached. 146. The summit is free from jungle and forest, the surface being clothed with rich grass. The spurs which run down from the summit to the base are intersected with deep ravines and dense luxuriant forests, and amidst the undulating surface of the mountain are rich and fertile valleys, intersected by numerous streams of various magnitude, all picturesquely contrasting with the bare and rugged heights, broken ridges, and magnificent bare walls of rock which surround them, presenting a view in the highest degree sublime.

STATIONS.	REPLIES.
II. The Pulney Hills—*cont.* *Rivers.*	147. There are upwards of 30 large streams on these hills, which uniting form 11 respectable rivers. From the summit of the higher peaks ascending above the plateau these rivers are seen meandering through dense sholas down deep ravines, falling over precipices in beautiful cascades, and finally passing down to irrigate the rich districts of Madura and Dindigul.
Villages and Inhabitants.	148. Several villages are scattered over the surface. The houses are irregular clusters, built of mud and wattle, and thatched. All are provided with fire places and sheds for cattle. The slopes in the vicinity of the village are formed into well irrigated and richly cultivated terraces. The adult inhabitants are a well formed and healthy looking race, and the children are vigorous and show no symptoms of spleen affections.
Geological Formation.	149. Gneiss, over which is generally found a stratum of clay overlapped by a thick covering of rich vegetable mould. On the summit and slopes the soil is shallow, but in the valleys it sinks to a greater depth, and in some parts a ferruginous and calcareous kunkur predominates.
Climate and Monsoons.	150. Four circumstances naturally affect the climate of these hills. 1st. Their elevation. 2nd. Their isolated position. 3rd. Their situation between the east and west coasts of the peninsula. 4th. Their position near the line of demarcation of the two monsoons, which make an annual tour, almost as regular as clock-work, over the peninsula of India as follows:—
	151. To commence, say from the eastern coast, they blow direct from the east about the end of February and beginning of March, then from south-east, gradually going south until by the middle of April, they blow from south, veering round towards the west; these winds bring up moisture from over the Indian Ocean, and rain falls on the highlands of Ceylon, and extend usually over the southern parts of the peninsula. Towards the end of May the winds blow from the south-west and west, bringing up large banks of clouds towards the western coast, which in the end of that month and beginning of June, burst on the coast; the highlands of the Ghauts receiving the great bulk of the fall.
	152. The rain falls heaviest at the western end of the Neilgherries, on the "Koondas," which are the highest parts of the line of Ghauts and in Coorg. On the coast it is lighter towards the south, increasing opposite the Neilgherry range to about 120 inches, which is the average fall at Calicut, and continues about the same up to Mangalore, opposite the highest parts of Coorg, where 180 inches fall, after which it decreases, and at Bombay the fall of rain is not more than about 80 inches. It goes on decreasing as it passes into Guzerat until it is lost altogether, there being no monsoon in Sinde. The rain passes inland from the western coast over the Mysore and the Deccan, and goes northward and eastward. In September and beginning of October, the winds veer round to north and north-east, and then occurs our north-east monsoon with its accompanying rains.
	153. The south-west monsoon sets in and prevails in Pegu at the same time as on the western coast, and the fall of rain diminishes as it goes inland north and east, just as it does on this peninsula.
	154. It will appear from this, that the Neilgherries on their western side receive very heavy rain, which extends as far as Ootacamund, whereas the hills to the south-east of the Neilgherries, such as the Pulneys, which are so much more inland, receive a lighter fall, at the same time that they share in the earlier rains of April, and again in the latter rains of the north-east monsoon, thereby giving them more the character of the climate of Kandy and Newera Ellia, and a greater freshness throughout the year, and in a measure a freedom from the aridity which prevails on the Neilgherries for three or four months.
Seasons.	155. The year is divided into two seasons, the cold similar to the autumn of the south of France, sets in in December and terminates in March, the remaining months resemble a mild autumn in the south of England.
	156. January is uniformly fair, clear, and dry. The nights are very cold, and attended with frost in the valleys. The same remark will apply to February, except that frost is stronger, and in March it disappears, when the weather becomes milder, and there are a few heavy showers. Towards the close of April, the wind begins to vary from north-east, and finally settles in the south-west, when the air becomes mild and balmy. May is the warmest month, but the heat is often relieved by the fall of rain in torrents, intermingled with hail, ushering in the south-west monsoon which occurs in the early part of June, and continues with greater or less constancy throughout July and August, when the weather on the lower hills is comparatively dry and fine. September and October are uncertain months, depending on the state of the south-west monsoon which, if begun early and exhausted, renders the weather fine, warm, and pleasant, but if deficient in previous rain, a good deal of mist and drizzle generally prevails. Towards the end of September the wind again begins to shift round to the north, when the weather becomes suddenly colder; mists and fogs are common throughout the year; some gales of wind occur once or twice a year, generally about the changes of season, but thunder and storms are of rare occurrence. The changes of temperature are sudden.
Salubrity.	157. The upper ranges are decidedly salubrious, in the lower the climate is hostile, and then from March till August malarious remittent fevers prevail. But it were difficult to find a climate more congenial to the feelings, more calculated to preserve health, or to restore the invalid, than this elevated area affords. Hardly a day passes without a refreshing sea breeze from either coast, rarified and rendered bracing by the altitude of the position, admirably adapting it to the unimpaired European constitution, and to the valetudinarian. I believe it calculated to promote recovery in all save the exceptional cases detailed in a former chapter. Vide paras. 121, 122.
	158. In support of my own views of the salubrity of the upper ranges of the Pulney Hills, I will now quote an extract from a communication from the Collector of the district, a resident there for several years, in reply to some observations made by the Director, now Principal Inspector-General, on my public report to him for the information of Government. "I conceive the remarks by the Director-General in regard to the salubrity of the upper ranges of the Pulneys wholly opposed to most clearly established facts. Mrs. Clarke and my family resided on these hills from July 1851 to January 1856, when they went to

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STATIONS.	REPLIES.
II. The Pulney Hills—*cont.*	England for the benefit of education. Mrs. Clarke and the greater part of the children never left the hills from the day they ascended there in 1851, till they came down in 1854, they enjoyed most excellent health and no doctor was ever called in to see them, Mrs. Clarke curing all their ailments; in fact, they enjoyed better health on the Pulneys than they did in England, where I afterwards lost two of diphtheria. "All who resort to these hills generally go up at the end of February, and remain till the end of October, when Madura (the head-quarters of the district) is bearable. Mr. Hodgson went up with fever in February, and benefited greatly while there. One Sunday in May he had a congregation of 50 including the American missionaries and their families. "I consider that the Pulneys should be the location of European troops stationed in the southern division. With rail, as is proposed, from the foot to Madura, and thence to Tutecorin on the south, and Trichinopoly on the north, and from Trichinopoly to Negapatam on the east, and to the junction of the Great Western Railway on the west, we could throw a fine healthy active body of English troops into every part of the south where they might be required. They could get down in six hours, and the rail would take them to any part of the division in 12 more." 159. Before it be finally decided to erect barracks for 1000 European soldiers at Trichinopoly, the extremity of the division, I would urge the consideration of the advantages of quartering at any rate, a portion of the force upon those mountains, which are situated near its centre, by which means military and sanitary conditions would be reconciled and probably equal influence would be exerted over the surrounding country. I am confident that any additional expense incurred would be fully counterbalanced by the favourable results which a well-directed system of interchange from the plains to the higher altitudes would produce upon the health of the men. I beg to refer the Royal Commission to Sir Charles Trevelyan's Minute on Madura, dated 8th February 1860, wherein he gives a glowing description of his visit to the hills which form the subject of this article.
III. THE NEILGHERRY MOUNTAINS.	160. The topography and physical character of this well known elevated range of mountains has been so frequently described, and the salubrity of these vast plateaus, which combines, with the advantages of a hill station, those of easy access and a sea voyage, is so well established, that it will be unnecessary for me to dwell on the subject at any length. 161. The Table at paragraph 116 gives the elevation and average temperature of the civil and military stations on these hills; Wellington being the only military cantonment. Here palatial barracks have been constructed for a complete regiment of European infantry at an enormous cost. This is a great mistake, first, because the climate is alone sufficient to ensure good health in an ordinary dwelling-house; and second, because although the Government may be disposed to adopt the plan of hill stations, an extravagant estimate of expenses to be incurred is apt to postpone or prevent the attempt. 162. I am quite of opinion with Sir Ranald Martin, who in his evidence before alluded to, states, "that provided the site be of sufficient elevation, well cleared, drained, and levelled, with a good water supply, the building material need not be of a costly character." Well-constructed huts of wood planking, raised on pillars two feet high, with deep verandas all round, and having space sufficient for 10 or 12 men, would be abundant protection. On the Penang Hill and on the high lands in Java, where the rain is more incessant than on our hills, houses are usually constructed of this material, and they are calculated to last for 15 to 25 years with ordinary repairs. 163. The station of Kotagherry on the Neilgherry Hills (6,100 feet above the sea) is considered the most salubrious on the plateau. Its climate is a happy medium between the other three stations of Ootacamund, Wellington, and Coonoor, and it is considered peculiarly favourable for convalescence from bowel disorders, dependent on functional derangements. Situated on a spur of the range, it overlooks and is easy of access with the plain below. The great trunk railway which crosses the peninsula from Madras to Beypoor, passes within a few miles of the foot of the hill, thus greatly facilitating the communication. 164. On this plateau I would recommend that barracks be erected for European convalescents resorting thither from Bombay, and from lower Bengal. In the former Presidency, there are no hill ranges of sufficient elevation to impart vigour to the convalescent, and even these are uninhabitable for many months every year, during the prevalence of the south-west monsoon. A couple of days would transport him from Bombay to Beypoor, the western terminus of the railway, and from thence to the foot of the Kotagherry pass, is but a few hours' journey.

South of the Ganges.

In Bengal.

Calcutta, 2 European Infantry Regiments, average strength	2000
Dum Dum, 1 do. do.	1100
Ditto 1 Company of Artillery	
Barrackpoor, do. do.	1100
Chinsura Depôt	1000

In Behar.

Hazarbog, 1 European Infantry Regiment	1000
Deyree, do. do.	1000
Dinapore, 2 ditto and Artillery	2100

North of the Ganges.

Buxar, 1 European Infantry Regiment	1000
Gazeepore, do. do	1000
Benares, 2 ditto and Artillery	2300
Allahabad, 3 do. do.	4000

165. In Lower Bengal, again, the large European force garrisoning the stations, as per margin, are unprovided with sanitaria; the fall of rain at Darjeeling, (10 to 12 feet per annum) the only mountain within moderate distance, renders it inapplicable for a convalescent depôt. Moreover, certain death would be the result of a march through the Terrai, a belt of jungle 50 to 60 miles in length, from Dinagepoor to the foot of the hills, between the months of June and December, which embraces the most trying season of the year. Invalids from all these stations would reach Calcutta, and be transported to Kotagherry with far greater facility and safety than to Darjeeling.

166. Thus, without the establishment of any means of transport beyond what already exists, the sick or wounded soldier may with facility be sent in the one case from Calcutta to Madras, and in the other from Bombay to Beypoor, thence in a few hours by rail without fatigue or delay, to a climate surpassing in salubrity any in the globe, where there is everything to exhilarate the mind and reinvigorate the drooping constitution, or if the nature of his malady be unsuited for a residence on an elevated locality, he can be landed, if from Bengal, at the "sea coast sanitarium" of Waltair, and if from Bombay, at that of "Sedashaghur," the description of which I reserve for a future occasion.

STATIONS.	REPLIES.
III. The Neilgherry Mountains —*cont.*	167. I append below an abstract for the current year of the annual returns of sick of Her Majesty's European regiments which have been received from out-stations up to this period. It will be observed, that although the regiment at Wellington has laboured under some disadvantages, consequent on want of space from the non-completion of the barracks, and the absence of other essential sanitary desiderata, which will ultimately be supplied, that their death-rate is lower than any other of the stations quoted.

Abstract of Sick.

Classes of Disease.	H. M. 60th Rifles, Strength 1,137, at Wellington.			H. M. 74th Regt., Strength 812, at Bellary.			H. M. 91st Regt., Strength 819, at Kamptee.			H. M. 1st Royals, Strength 1,045, at Secunderabad.			H. M. 17th Lancers, Strength 448, at Secunderabad.			18th Royal Irish, Strength 961, at Secunderabad.		
	Total treated.	Discharged.	Died.	Total treated.	Discharged.	Died.	Total treated.	Discharged.	Died.	Total treated.	Discharged.	Died.	Total treated.	Discharged.	Died.	Total treated.	Discharged.	Died.
Fevers	184	176	5	207	203	1	293	281	2	298	288	3	854	841	5	515	501	5
Eruptive fevers	—	—	—	1	1	—	—	—	—	1	1	—	4	2	1	—	—	—
Diseases of the lungs	67	63	2	67	63	2	33	32	1	99	94	3	62	61	1	73	70	2
Do. of the liver	47	44	1	62	59	1	30	27	2	233	221	8	31	28	1	49	45	—
Do. of the stomach and bowels.	180	175	1	180	174	3	172	162	3	547	534	6	261	249	10	438	425	13
Do. of the brain	27	24	—	25	15	9	19	12	6	11	9	2	37	27	8	12	9	2
Epidemic cholera	—	—	—	3	2	1	12	3	8	10	7	3	44	17	27	29	17	12
All other diseases	532	489	1	738	711	4	458	452	1	601	579	—	471	455	—	624	588	—
Total	1,037	971	10	1,283	1,228	21	1,017	949	23	1,800	1,733	25	1,764	1,680	53	1,740	1,655	34
Average deaths to strength per cent.	0·87			2·58			2·80			2·38			11·83			3·53		

168. During a service of 24½ years I have frequently had my attention called to the debilitating effects of the climate at Cannanore on the constitution of Europeans who have resided there for a series of years. The report of the surgeon 74th Highlanders for the past year, now before me, goes to substantiate my views on this point. He observes, "The remarks which I have before made relative to the debilitating, relaxing, and undermining effects of the climate of the western coast (where he was stationed with his regiment three years) have been but too fully and practically illustrated. The great majority of men and officers who served there for from three years and upwards, have either died, been invalided, or sent home sick. One of the great peculiarities of the climate seems to be, that while on the coast men like it, are not often sick, it is when they go to a drier climate that the mischief becomes apparent. I am strongly of opinion that, if possible, no regiment ought to remain on the western coast more than two years during the time of Indian service."

169. If strategetical considerations would admit of holding Malabar and Canara and the western portion of Mysore under control, by stationing a portion of the European force now at Cannanore on the Neilgherry hills, a salutary hygienic interchange of the allotment for this division of the army from the plains to that elevated plateau would be an important sanitary change on the present system of retaining the corps there for a series of years. The railway from the neighbourhood of Cannanore to the foot of these hills affords facilities for putting this plan into force in the space of a few hours' duration.

170. I beg to draw the attention of the Royal Commission to the large number of admissions from fever at Wellington on the Neilgherry plateau. The prevailing type being a low remittent or typhoid; a disease which is admitted to have its origin in a poison produced from refuse animal matter allowed to decompose and taint the air we breathe or the water we drink. In former days this malady was unknown on the hills; but, as before observed, it is now common to the plains also, arising I believe from the same cause.

171. I believe that much mischief is done by the want of proper attention to conservancy during the construction of public buildings, on which thousands of labourers are employed for a period of months and perhaps years, and that the absence of this is now in a great measure the cause of the zymotic affections, which are endemic at this station.

172. When on duty in September 1858 on the Neilgherries with Lord Harris, our late Governor (who eagerly adopted, and so far as his power lay, enforced the introduction of any well-arranged system of sanitary reform brought to his notice) I was compelled to bring to his Lordship's notice the imprudent neglect of prophylactic measures during the construction of these barracks, as follows:—

"The strictest attention is now required to sanitary matters, while so many labourers (3,000) are at work on the buildings, for nothing can be more noxious or offensive than the system at present in force. The cantonment and neighbourhood is tainted with fœcal atmosphere; go where you will, in the unfinished buildings, in court-yards, even in the well-finished rooms, human ordure is found. Already the result of this neglected conservancy is exhibited in low fevers amongst the European children and adults, and there is danger that the place may become so polluted as to establish a malarious atmospheric taint which may hereafter become an incidental source of disease. The coercive interference of Government is therefore required to preserve the character of the station for salubrity."

173. Although measures were forthwith adopted to correct the evils above described, I believe the seeds then sown are now producing baneful fruit. But I will reserve any further observations I have to offer on this head until I treat of barrack accommodation generally.

174. I cannot concur with those who argue against hill stations, because from their isolation and seclusion soldiers dislike them. True there are here greater facilities for separating the men from the debasing effects of drunkenness and low vice which they unfortunately indulge in in the plains. But in so enjoyable and temperate a climate, there can be found employment in abundance as labourers and artizans on public works, in making up their own appointments, in gardening, &c., &c., instead of being permitted, as is too frequently the case, to lie in bed sleeping and dozing all day long, a practice, the *ennui* of which I believe to be second only to the above-named morbific influences on the constitution of our troops.

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	IV. Bangalore.	175. As a sanitarium, from its central position, its elevation 3,000 feet, and the salubrity of its climate, is one of the best and most important positions in the south of India, whether considered in a military or sanitary point of view. Sir Alexander Tulloch, in his evidence before the Reorganization Commission, says, that from returns extending over a number of years, it appears that troops located at Bangalore do not sustain a greater loss than 3 per cent. annually, and a considerable portion of even this number arises from disease contracted at other unfavourable stations. 176. The death-rate at Bangalore from 1842 to 1857 inclusive has only been 2·2 per cent. per annum, and I have every reason to believe, as superior accommodation is provided the soldier, that we have not yet attained our minimum in this respect. Vide Return 1859–60. Appendix C. 177. It would therefore seem advisable that the station should be considered the most important, and be the most numerously garrisoned of any in the country. It does not appear to have a single objection.
	V. Ramandroog Hill.	178. The only remaining station for European troops south of the Kistnah is Bellary, the head-quarters of the Ceded Districts. It is now 12 years since the solitary hill which forms the subject of this chapter was first occupied as a convalescent depôt; 12 years prior to then, when I first did duty at Bellary, a deadly fever was supposed to be the certain result of a visit to the locality. Times are now changed, and experience has taught us that the number and extent of our hill stations may be increased with the utmost advantage to the health and efficiency of all who resort thither. 179. Ramandroog is 38 miles distant from Bellary, and it is one of a broken series of hills denominated the Sundoor range, encircling a rich well watered valley of the same name. The entrance into this valley from Bellary is peculiarly picturesque. To the right and left an unbroken semicircle of mountains approach each other; at a distance they appear to unite in the centre of the arch, but as you approach you find them cleft to their base, and giving passage to a narrow winding mountain torrent, whose bare perpendicular rocky sides tower many hundred feet above you. 180. There is an easy ascent to the summit of the mountain, at its greatest elevation above the sea, viz., 3,400 feet, and 1825 above Bellary there is a cleared platform, one mile and a quarter in length, and about as much more of a like elevation connected to it by a tongue of land, but yet uncleared. The entire hill is hornblende, peculiarly rich in iron ore. Some, detached pieces affect the magnet, and beneath the vegetable mould which ages have accumulated on the surface, lumps of pure metal crop out from masses of scoria. A disintegrated lateritious earth has accumulated on the surface of the hill, the decomposition of the hornblende. The extreme porousness of this mass gives immediate passage to surface moisture, so that no water is found until the underlying rock is reached, usually at a depth of about 500 feet from the plateau above, where there is a perennial supply. 181. The average temperature of the Droog somewhat resembles that of Bangalore; but the variation of the thermometer is less, and the climate is much more equable. Throughout the year the temperature is most agreeable to the feelings, imparting elasticity to the constitution, and inviting out-door exercise. From its solitary position, even in the hottest seasons, the air reaches it fresh, rarefied by elevation, not obstructed by high walls, not heated by passing over a large extent of table land, and not rendered impure by emanations from town filth, such as is too often the case at Bangalore. 182. Ramandroog is essentially a convalescent station. On the occasion of my visit I found in the depôt invalids from the Royal Artillery, H.M. 12th Lancers, H.M. 1st Batt. 1st Royals, H.M. 74th Highlanders, H.M. 3rd Batt. 60th Rifles, and H.M. Indian Artillery. Only one death had taken place among the invalids during the 12 months prior to my visit, and the books exhibited only an average daily sick list of $11\frac{3}{4}$ per cent., a rate which does not exceed that of a healthy body of men in the plains. The great advantage of the climate of the Droog is owing to its unvarying and equable temperature, whereby the natural action of the skin and kidneys are neither excited nor checked, and thus congestions of the large organs are avoided. 183. Some of the convalescents whom I met on Ramandroog I had seen nine months before in hospital at Secunderabad, reduced to death's-door from dysentery, and apparently without much hope of recovery; now what a marvellous change for the better; one of them observed in reply to my questions, "I was but a short time here, Sir, when I got an appetite like a horse, and instead of feeling weak as a child scarcely able to crawl, I was continually on my legs, and I am now nearly as stout as ever." 184. This is essentially one of Sir Ranald Martin's "valuable islands in the plains which has sanitary excellencies peculiar to itself." The climate is well adapted for all who are free from organic disease; it supports a slight decline of health, and provides against threatened alterations of structure, although it cannot restore a constitution thoroughly broken down.
	VI. Sanitaria for Secunderabad.	185. The turbulent character of the people of Hyderabad render the presence of a strong European force here indispensable. There are no hill stations near it, and the sea-coast sanitaria are hundreds of miles off. It is no doubt, therefore, a very difficult station to deal with, more especially as it bears at certain seasons a bad reputation for the European soldier. In 1858 the mortality, chiefly from hepatitis and sanguineous or scorbutic dysentery, was— 1st Royals - - $10\frac{1}{5}$ per cent. Lancers - - 5 per cent. Royal Artillery - 5 „ Madras Artillery $3\frac{1}{8}$ „ Military considerations here override medical ones, our only alternative therefore is by the erection of barracks upon the most approved principles, and upon the healthiest spots, by protection against overcrowding, by a liberal supply of vegetables with their food, &c., to guard the health of the troops as far as possible. 186. Convalescents from Secunderabad are now either sent to the Ramandroog Hill, near Bellary, upwards of 300 miles over a difficult road, or they proceed to Masulipatam, the nearest point to the coast, about 200 miles, with the view of taking passage to Madras, or to the sea-coast sanitarium of Waltair; in both cases involving a journey of much fatigue and danger to the invalid. This station is 1,800 feet above the sea. In 1846 I was encamped between the 20th January and 20th March on a solitary hill, called Dungoond, one of Coilcondah range, about 2,600 feet above the sea. It was a common place of resort for the officers and their families, from the oppressive heat of the station of Muctul,

STATIONS.	REPLIES.
VI. Sanitaria for Secunderabad —*cont.*	which we then occupied; we always enjoyed the change, and found much relief from the extreme heat below. In 1849 I made a short report to Government on the topography, &c., of the hill, from which the following is an extract:— "The village of Dungoond, from which the hill derives its name, is situated in the Chetapoor Talook, and is, I believe, a jagheer of the Newab Shumshul-oomah of Hyderabad. It is almost an isolated mountain, being connected at its base towards the south-east, to a chain of high land, which forms a continuous ridge with the Aloor and Palmoor group. Towards the north-west the hill terminates at first in an abrupt slope, which soon becomes more gradual until it reaches the river Bema, some 1,500 feet beneath the surface plateau of the mountain, is about four miles long by one broad. "The hill is of trap rock formation, its summit presents a beautiful extent of table land, eight or ten miles in circumference, with neither rising ground or jungle to intercept the view, or the free current of air from one side to the other. The soil on the centre of the plateau is kunker, it is more elevated than the circumference, which is a black loam; there is no stagnation of water on it. Extensive beds of rich iron ore are seen. The slopes on the hill and for miles around on every side are covered with thick jungle. There are three perennial springs on the hills, affording a bountiful supply of excellent water. "The inhabitants residing on the two villages on the summit appear robust and healthy. They cultivate large and rich crops of pulses, &c., and assert that fever is not a disease of the mountain, although they often contract it below. Amongst the European adults and children who resorted to the hill no case of fever occurred. I was particularly impressed with the salubrity of the position, and consider it well adapted for those who begin to exhibit declining health. A thermometer suspended under a tree denoted a lower range at noon, than it did at sunrise in the plains; the lowest range being at sunrise 59°, at 9 a.m. 73°, at noon 82°, at 3 p.m. 78°, and at sunset 72°, while the highest temperature indicated at the same periods of the day was 66°, 79°, 85,° and 84° of Fahrenheit, the greatest variation in the 24 hours being 23°. There was seldom a lull in the wind. "There is nothing in the appearance of the site nor in the surrounding country which would lead one to dread impure exhalations; on the contrary there is every indication of much purity of atmosphere, and the natives assured me that they are never visited with endemic disease. I am of opinion, even should it not realise the expectations I have formed of it, that it may notwithstanding prove an acquisition to the Hyderabad division of the army at certain seasons. It is said to be distant from Secunderabad about 70 miles south-west, and from Sholapore, a military station on the Bombay side, 40 miles." I am not aware that any steps were taken to examine further into the practicability of converting this hill into a sanitarium. The serious difficulties we encounter on this score, at the large military station of Secunderabad, may now induce an inquiry into the subject, as well as expedite the arrangements proposed at paragraph 88.
VII. SANITARIA FOR JAULNAH.	187. The question of the transfer of the military force at Jaulnah to the neighbourhood of Arunghabad, is now, I understand, under discussion by the authorities. Hitherto of all our stations garrisoned by European troops, Jaulnah has exhibited the smallest death rate. Doubtless sound military reasons exist for this meditated change, and it would not be becoming in me to observe on these. But in the location of troops sanitary considerations are so intimately blended with military, that I may be excused expressing my views on the contemplated measure. 188. I have no hesitation in saying that our past experience of Arunghabad does not speak well for its future salubrity, for an European garrison. Fever is endemic to the spot, and a peculiar annoyance is caused by the high winds, which come in gusts between the gorges of the hills, making the site not only disagreeable but injurious. If on military grounds Arunghabad should be considered a better site than Jaulnah, then the country around Roza should be thought of. But before the great outlay of building barracks anywhere be entered on, the question should be well considered, whether the site should be fixed as suggested; or on the range of table land extending from Luckenwarra to Adjuntah, in the vicinity of Booldana, where the climate is very fine. 189. The table land about Booldana forms the southern wall of the valley, and you look down to the plain beneath, a descent of 700 to 1,000 feet. The atmosphere on the higher regions thus situated is more free from unhealthy influences, and there is a greater difference in the climate than can be accounted for by the mere difference in altitude; moreover, the medical statistics of Booldana itself during the 20 years which our knowledge of it extends, for the hill which passes by that name has long been a resort for Europeans from Jaulnah and Arunghabad, are favourable to its salubrity. 190. There might not be a sufficiency of water for a large body of men on the plateau of Booldana; but the valley of the Paingunga lies a mile from it, and the river of the same name running through it never dries, and the wells all along the valley are always abundantly supplied. But even on the highest plateau, a little expenditure, by running bunds across the gorges of ravines, would store any amount of water for the troops. In determining, therefore, on the future site for a military station, I recommend that the ground somewhere near Booldana should be seriously taken into consideration. Booldana is about 75 miles from Arunghabad, and 60 miles from Jaulnah, in latitude 20° 34′ north, longitude 76° 24′ east, situated on the Luckenwarra and Adjuntah range of hills; its probable elevation being 700 feet above the plain of Berar, which is 1,300 feet above the sea. The average rain fall is 28 inches.
VIII. CHICULDAH.	191. This is another range of undulating table land which may be turned into use as a sanitarium for European troops occupying the upper Deccan. The plateau of Chiculdah is one mile in length and three quarters of a mile broad. It is situated in latitude 21° north and longitude 77° east. It is one of the Vindhya, or as some denominate it the Gawilghur range, and is 3,600 feet above marine level. 192. It has long been a favorite spot of resort for ladies, and children, and for invalid officers serving in His Highness the Nizam's country, who can bear testimony to the benefit they derived from a sojourn there. The varied and extensive scenery, and the bracing air which prevails during the hot season, exhilarates the mind and brings immediate relief to the lassitude induced by the suffocating heat usual in the Deccan at this period. The mean temperature of the plateau is 71°; the hottest months, April and May, give a mean of 83° and the coldest, January and February, 59°. The hottest day ever observed the thermometer rose to 96°; the coldest it sunk to 47°. The greatest diurnal range was 22°, the least

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STATIONS.	REPLIES.
IX. SANITARIA FOR NAGPORE AND KAMPTEE.	4°, and the annual fall of rain averages from 45 to 55 inches. Potatoes and other European vegetables thrive well on the summit of these hills. 193. This is the last of the great military cantonments in the Madras Presidency occupied by European troops, which will come under review under this head. Until lately Nagpore had no sanitarium, the usual course being to send the invalid to Madras for change of air, a distance exceeding 700 miles. 194. Recent inquiries, however, hold out flattering hopes that a very eligible site for European convalescents and others has been discovered on the Puchmurree range of hills, at a place called Muthoor, which lies contiguous to the following 12 stations:—Sehore, distant 114 miles; Saugor, 104 miles; Dumah, 117 miles; Jubulpore, 105 miles; Mundla, 117 miles; Nursingpore, 59 miles; Hoosingabad, 62 miles; Baitool, 50 miles; Sconee, 64 miles; Bundwarra, 102 miles; Kamptee, 83 miles; and Nagpore, 84 miles. The stations of Kamptee, Saugor and Jubbulpore being provided respectively with accommodation for 1,800, 1,200 and 1,000 European soldiers; so that the convalescents of a force of 4,000, amounting probably to 200 men, besides women and children, have now a prospect of reaching a healthy hill station, nearly 3,500 feet above the sea, in a period of a few days. 195. At a distance of 50 miles from Kamptee, and 30 from Muthoor Hill, is Chindwarra, a civil station in the Nagpore division, 3,000 feet above the sea. The climate here has already proved beneficial to European invalids, and sanguine hopes are entertained that the more elevated plateau will surpass it in salubrity. An intelligent committee of military and medical officers sent there in the hottest season of the year, report most favourably of the Muthoor sanitarium site; a valley 1½ miles long by ¾ of a mile wide, having a good water supply, and a mean temperature during the day, in the month of May of 87°, and of 78° from sun set to sun rise, the average daily temperature being 83° or 11½° lower than Kamptee. 196. The Committee are of opinion that the Muthoor sanitarium offers very considerable advantages as a station for invalids, and that it is possible it will bear comparison with Ramandroog, which is about the same height above the level of the sea, and has been found one of the most useful sanitaria for invalids generally in all India. It lies in 22° 13′ north latitude, and 78° 40′ east longitude. Unfortunately the state of our finances in India has for the present retarded the construction of buildings on the site, with the view to its occupation.
X. SEA-COAST SANITARIA.	197. At paragraph 122 of this report, I observed on a numerous and important class of diseases which rapidly run to destruction at elevated ranges—an extra tropical climate, a sea voyage, a residence on the coast, or at salubrious localities within the softening and refreshing influence of the sea breeze, constituting the only safe and efficient remedy for them. 198. The establishment of a sanitarium at Cape Town for coast sick, is likely to be the means of restoring the health of many men of Her Majesty's forces who have suffered within the tropics, embracing as it does a considerable sea voyage, in addition to a sojourn in a temperate climate. 199. But there are three localities (vide large map) on the line of coast between Calcutta and Bombay, to which I would draw the attention of the Royal Commissioners as suitable sites for sea coast sanitaria for European convalescents and others, for whom the longer sea voyage to the Cape may not be deemed necessary. The first of these is—
XI. WALTAIR.	200. The head quarters of the northern division of the Madras army, and a most eligible position on the Bay of Bengal for the formation of an extensive sea coast sanitarium. In form it represents an elbow of land running out into "Lawson's Bay," which is bounded on the south by the "Dolphin's nose," a ridge 450 feet high; and on the north by "Lawson's ridge," of nearly equal elevation. These elevated points approximate inland, assuming a crescentic or horse-shoe figure. The distance between the horns of the crescent exceeds six miles. From the point of the elbow the ground gradually ascends on every side to the centre, a distance of two miles, to an elevation of 210 feet above high-water mark. This high ground comprises an area of about a mile in length, and two in breadth; the distance from the surrounding hills varying from two to four miles. 201. The peculiar formation of this space secures to it a very equable temperature. The scorching hot winds which prevail in other parts of the division at certain seasons are unknown here, the usual difference in the thermometer at this period being 13°. The daily variation throughout the year averages 4°; the maximum is 90°, and the minimum 70°, the annual fall of rain being 41 inches. Thus, when there is no direct sea breeze, the land wind, broken by the surrounding elevated ranges, reaches the station converted into a sea breeze, untainted by emanations from the soil. 202. The testimony of those who are acquainted with the locality for years, as well as medical statistics, are strong on the question of its salubrity. Acute disease is almost unknown, and its character for a sanitarium has already been established. The relaxing effects of the west coast are not experienced here. 203. His Excellency Sir Patrick Grant, in whose company I visited this station, by earnest and unceasing entreaty, has induced the Government of India to sanction some expenditure towards the erection of accommodation on this desirable locality. Sensible of the importance of discovering elevated table land within the influence of the sea breeze, and that a combination of a residence on the coast for invalids suffering from organic disease, and afterwards as convalescents, to recover their strength, on more elevated ranges, offers the best prospect of restoring men to health and rendering them effective—His Excellency has also for many months past caused practical inquiry to be made as to the salubrity of certain portions of the Orissa range approximating the coast, varying in elevation from 3,500 to 4,500 feet above the sea, termed Gallicondah. 204. I believe that success will result in these inquiries, and that the station of Waltair will become the most desirable one in India, for ere long the sick soldier, suffering from structural disease, can be conveyed from Secunderabad after a land journey of some 50 miles, in comfortable boats on the Kistnah or Godavery, afterwards on the line of canal which will shortly intersect that country to the coast, and thence by steam to the spot; or if from any of the stations in Lower Bengal, once shipped in Calcutta he will in the first instance receive benefit by the sea voyage, and thereafter at Waltair, where he will arrive by steam in 48 hours after embarkation.

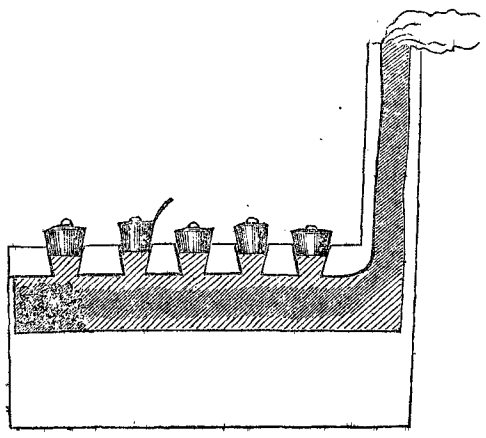
Stations.	Replies.
XII. Cape Calimere.	205. No atmosphere is perhaps more salubrious than that of the sea coasts of continents. The cape called Point Calimere, which juts sharply into the sea 28 miles south of Negapatam, possesses an equable and moderate temperature, and enjoys a great immunity from disease. The soil around is sandy; to the west is a salt tidal marsh, which does not appear to affect the salubrity of the place. It is much famed for the coolness of its climate, and for the refreshing and invigorating influence of its pure sea breeze. The place has long been an agreeable resort for invalids and others during the hot months in the interior. Its position, contiguous to the Pulney Hills and adjoining the terminus of the railway now in progress at Negapatam, adds to its importance as a sea coast sanitarium.
XIII. Beitkul Bay, or Sedashaghur.	206. On the western coast, about 48 hours steam from Bombay, between Mangalore and Goa, a spur of the range of Ghauts, in North Canara, averaging a hundred feet in elevation, runs into the sea for upwards of a mile, and, with islets contiguous, forms a noble nearly land-locked bay. The circumference of this bay cannot be less than 10 miles; it has seldom a ripple on the surface, and there is deep water close to the land. A detachment of native troops are located here, and the intelligent medical subordinate in charge informed me that the salubrity of the position is past question, and that during his residence there for six years not one case of cholera occurred, although the disease frequently raged all around. I think the place admirably suited for a sea-coast sanitarium at all seasons, except during the prevalence of the south-west monsoon, more especially for invalids from Bombay.
XIV. Résumé.	207. I have now completed the subject of sanitaria, and I hope I have not been altogether unsuccessful in showing— 1st. That frequent change of air is perhaps the most efficient mode of preserving a high standard of health in India. 2nd. That by the location of a portion of our European troops occasionally on hill plateaus, not only would they be available on emergencies, but their health and efficiency would also be secured. 3rd. That political, financial, hygienic, and, I would add, compassionate considerations demand that our British soldiers should occupy stations favourable to European life; and doubtless the most innocuous known positions are the summits of our mountains. 4th. That every military station of importance in the southern peninsula, except Secunderabad, has in its vicinity healthy hill ranges adapted for the residence of Europeans, and that our military positions would in no degree suffer by quartering portions of our regiments upon them. On the contrary, in a strictly military point of view, the possession of high ground is advantageous, especially if military works are in contemplation. 208. It will of course be necessary that careful examination of the proposed new stations be made, to ascertain that they fulfil the conditions necessary. All I would urge is, that hill ranges do exist in the neighbourhood of the most important military stations; and it is therefore well worth inquiry whether such might not be rendered available as proposed, whereby the present high rate of mortality and invaliding might be reduced. 209. Finally, as regards the disposition of our sanitaria, I have attempted to show— 1st. That the upper ranges of the Shevaroy Hills are available for the freshly-imported recruit, for time-expired men and invalids preparatory to embarkation, and for the introduction of a healthy interchange of a portion of the European force stationed at the Presidency. 2nd. That the Pulney Hills are available for the introduction of a system of interchange for the European force stationed at the head-quarters of the southern division of the army. 3rd. That Wellington, on the Neilgherry Hills, is available for putting into execution the like desirable measure for the force at Bangalore and Cannanore. 4th. Kotagherry, on the same mountain plateau, can be turned to good account for invalids from Bombay and from Lower Bengal. 5th. That Ramandroog, near the head-quarters of the Ceded Districts, although of moderate elevation, has acknowledged superior advantages in itself, which ought to influence us in prosecuting our inquiries into similar elevated ranges, and induce us to extend the beneficial influence of its climate more generally than we now do. 6th. That invalids from Secunderabad can be sent to Ramandroog, should no other mountain be discovered more contiguous to the station. 7th. That Chindwarra and Muthoor are available for the convalescents from Kamptee and other stations in Central India; and 8th. That sea-coast sanitaria are available on the north at Waltair, on the east at Point Calimere, and on the west at Sedashagurh, for invalids from the three Presidencies.
	DISEASES, &c.
I. Venereal Disease.	Destructive effect of venereal disease on the health of the soldier, and the loss of efficiency resulting therefrom:—
	210. This difficult question is now attracting the attention of reflecting men at home, both in its physical and moral bearings, and it becomes us to look at it in the face here, in relation to the health and efficiency of the army generally. 211. From the army statistical reports presented to Parliament two years ago by Her Majesty's Commissioners, we gather that the admissions into hospital from venereal diseases amount to 206 in every 1,000 cavalry, and 277 in every 1,000 infantry of the line; that on an average 688 men out of the home force are always in hospital from this cause alone, and that the money loss to the State from this cause is calculated at nearly 14,500*l.* per annum. This is only a part of the enormous evil, for a large proportion of the sufferers have their constitutions permanently impaired. Other diseases are induced or aggravated by the venereal poison, and the mortality and invaliding are largely affected by it. 212. If we turn to India we find the case no better. At all stations of the army where European troops form part of the garrison an organized system of prostitution is in force. A more respectable class, under the control of a procuress, and a low debased class who acknowledge the control of a male pimp. Soldiers usually visit these women between 2 o'clock p.m. and evening roll-call. They often take a fancy to one particular woman, and by previous arrangement visit her. Some females informed me that between 2 and 8 p.m. they have frequently been visited by 10 and 12 soldiers, and that, too, after they had contracted disease. In course of my inspection cases have come to my notice where

Inspect.-Gen. Macpherson's Report. Madras.	Stations.	Replies.
	I. Venereal Disease—*cont.*	soldiers had intercourse with females under treatment, regardless of consequences which they knew must result. A certain number of the debased class attend on guards, and prowl about the barracks when night comes on; and when a regiment proceeds on the march some of them accompany it, encouraged to do so by the soldiers clubbing together for this purpose. 213. It was necessary to enter thus much into detail in order to show how the thoughtless soldiers seek to gratify the strongest of their appetites, reckless of the consequences to themselves and to the State. At Cannanore, and along the western coast generally, I found venereal disease in its worst form, and it was a common occurrence to find the primary and secondary forms of the malady occurring simultaneously. It is partly from this deplorable state of matters that cutaneous affections in their most hideous forms are so common here, on the Malabar coast. 214. H.M. 66th Regiment, garrisoning this station, had 25 per cent. of the strength under treatment for the well-marked Hunterian chancre with indurated base, or that form which, according to our best authors, is essentially the infecting chancre which generates constitutional syphilis. At Trichinopoly the baneful effects of this disease were more evident in the 2d European Light Infantry, its constitutional as well as its primary effects were in active operation. Within 10 months after the arrival of the 1st King's Own Dragoons at Bangalore, there were 170 admissions from syphilis, out of a strength of 520, and in the same period and at the same place I found that the enormous number of 394 had been admitted into hospital with this loathsome disease, out of an average strength of 745, in the 60th Rifles. 215. But I need not multiply instances. The returns in the body of this report show the extent of the disease. At all our stations, civil as well as military, in the progress of my inquiries, I found that syphilis was the curse of the place. I have witnessed it in the child of five years of age and in the old hag of 60. I have traced the history of many who imbibed the disease early in their career, and have arrived at the conclusion that five years was a liberal average within which one-third become broken down and unfit for active service. At Poonamallee, the depôt for Her Majesty's regiments at this Presidency, an opportunity was afforded of seeing syphilis as a cause of invaliding and premature inefficiency in full operation. The great majority of invalids had their constitutions more or less impaired by the destructive poison—a poison, too, which passes down to their posterity, which they imbibe in the public service. 216. We have now to consider the best means of meeting this indisputable evil. We cannot, perhaps, indulge the hope that this terrible disease can be entirely banished from the army, but it is our duty to devise some plan to reduce it to its minimum. The marginal note at paragraph 28 of this report, will show that, through the interference of his Excellency the Commander-in-Chief, active measures towards the introduction of a reform in this matter have already been instituted. But more than this is required. To a large body of our soldiers marriage is forbidden. In time of peace the *ennui* of a soldier's life is great everywhere, but in this country, shut up the greater part of the day, as he has nothing to occupy his mind, he seeks for excitement in every den of vice and debauchery to which he can obtain access. 217. I am of opinion that the system of moral and religious instruction which has of late years been introduced into this country through the educational department, should be extended so as to embrace our European military schools; that healthful and improving employment and recreation, and every possible means, consistent with discipline, should be used to raise the tone of the soldier's mind, and to wean him from habits as destructive to himself as they are hurtful and costly to the state he serves. 218. But I am not so utopian as to believe that we can gain our end entirely, or even mainly, by such means. We must have recourse to other measures. We must have the aid of the magistrate to help us in controlling this "social evil;" and here we are sure to be met with many objections. Interference of this sort is not congenial to British habits, customs, and tastes; it is "inquisitorial and unconstitutional;" it is "contrary to the liberty of the subject." The fastidiousness of our countrymen in matters of this sort is notorious. It has long stood and still stands to some extent in the way of many sanitary and social reforms; but, apart from other considerations, the time has now arrived when the Government must act regardless of such feelings, if they really desire to secure to the State the full measure of service from those alone on whom we rely for support. 219. The best mode of dealing with this, the police part of the question, has occupied my most earnest attention. I have put myself in direct communication with several civil magistrates of experience and ability; and my mind is now fully assured that before one step is taken in this direction, a legislative enactment is required, to have general powers conferred on the local Government to pass rules for the "better prevention of the spread of venereal disease in large towns and in military cantonments." This is a better title than "An Act for the better control of prostitution." The law should, in the first instance, be put into force in all military cantonments and sea-port towns, and penalties should be enacted in all cases of its infraction. 220. For the administration of the law, appoint the commandant or the magistrate of the district, the police officer, the surgeon, and the chief native official at the station as Commissioners; then license and register every brothel and prostitute, and have them open to constant inspection. Respectable nurses, and native dressers, and some well selected peons would do the work of inspection at the brothels; and the surgeon in charge of the lock hospital would receive and arrange the sick in the building with a view to their comfort as well as to their respectability. With good management the utmost success might prevail. The women will thus become in a great measure their own police and spies, and their own sanitary commissioners. I would earnestly press the serious consideration of this subject on the Royal Commissions, for the evil is a shocking one, and it is increasing on our hands.
	II. Intemperance.	221. While I believe that the consumption of spirits by the soldier is a fertile source of disease, I am also of opinion that a moderate use of malt liquor or wine is favourable to his health. I would withdraw the spirit ration altogether, remove spirits from the canteen, and restrict the sale of it in the bazaars to soldiers, and substitute in its stead good malt, light wines, tea and coffee.

STATIONS.	REPLIES.
III. HEALTH OF THE TROOPS.*	222. A gravelly surface and sandy subsoil, or a sandy surface and gravelly subsoil is that best adapted for barracks. A rocky substratum is also good; but a substratum of compact clay retains moisture, is damp and cold, and should be avoided. (Query 18.) 223. Sixteen years is a good age for recruits to enlist in England, to come to India about 17 years. He should land between the middle of August and middle of March. I would certainly recommend his being sent immediately, by rail or other conveyance, to the hills for two years or upwards. He should take with him tweed or other clothing from England for this purpose. There he must be marched about, drilled, made to garden, work at trades, &c.; in short, taught to be industrious, before he be sent out to mix with the idle old soldier. There will then be no need of intermediate depôts. The soldier would thus be gradually accustomed to the climate, and he would not be exposed to the many dangers which beset his path in the early years of his service. (Queries 19 to 20.) 224. If the course I have urged under the head of hill ranges be put in force, I see no reason why a soldier may not be able to continue the full term of service for which he has enlisted in India, without subjecting the state to any additional cost. I think it should be so arranged that invalids should reach England about the middle of spring. The foregoing remarks are equally applicable to all young officers, as well as soldiers, arriving in India. The plan now adopted of transporting men, by bullock transit, from one station to another has greatly diminished mortality. In none of the moves conducted in this way has cholera appeared; formerly, no march was made without it. The effect of exposure and fatigue on young recruits was well exemplified in the large mortality and prostration during the march of the 4th King's Own from Ahmedabad in June last year. (Queries 21 to 23.)
IV. CAUSES OF DISEASE.	225. It is universally allowed to be a matter beyond further question that visitations of the entire class of zymotic diseases, as typhus, scarlet fever, dysentery, diarrhœa, and cholera, are governed by the same laws. The predisposing causes may be denominated, 1st. Remote. Produced by a disturbance of the electric and magnetic forces of the atmosphere, rendering the animal frame prone to imbibe disease. And, 2nd. Proximate, as the respiration of a vitiated or poisoned atmosphere, noxious effects of bad water and food, excesses either in eating or drinking, &c. The two former being produced by, *a.* Overcrowding or lodging an absolute number of individuals in a given space, without the means of renewing the air. *b.* Privies, cesspools, graveyards, &c., and the noxious influence of putrid animal effluvia, whether these proceed from foul drains and sewers, from slaughter-houses, or animal dung heaps. *c.* Water polluted by percolation into wells of the contents of cesspools, graveyards, drains, &c., contaminated by deleterious gases, and decomposed by organic and other noxious matter, or the original impurity of the supply. *d.* Defective supply of pure water, which is essential to personal cleanliness, and as an article of food. As water forms nine-tenths of the weight of the body, it penetrates into the substance of every organ, and it must be the medium for all the changes effected in the frame. *e.* The use as food of diseased or improperly fed animals. The regulation which provides for an inspection of the soldier's animal food before issue to the men should be extended to an examination of the animal before it is slaughtered.
V. CHOLERA.	226. There are many circumstances connected with outbursts of this pestilence which are apparent, and others which are, as yet, inexplicable to us. The following, amongst others, have come before me in the course of my inspection tour:— 1st. In the Salem district six miles from Trippatoor, about 100 men, of a nomad tribe, were employed in making a cutting on the line of the railway through disintegrated granite, some 20 feet in depth; suddenly springs of clear and tasteless water were exposed, and almost simultaneously with this, a virulent outbreak of cholera appeared, which carried off 15 of them in 48 hours. The band immediately thereafter dispersed; and although others sunk from the effect of the disease, evidently imbibed on the spot, no fresh seizure took place; nor did the disease spread among the many other hundred workmen who were employed at no great distance. 2nd. A detachment of Her Majesty's 74th Highlanders, when en route from Sholapore to Bellary, in the month of January, at the time in perfect health, marched past (100 yards distant) a camp of native soldiers, who were suffering at the time from cholera; three days afterwards the disease appeared in the detachment and carried off seven men. 3rd. The magistrate of the district of Malabar having reported to Government, that within a limited range of his district 1,539 deaths had taken place out of 1,796 seizures from cholera, I was directed to inquire and report thereon. In passing through the district I satisfied myself that the report by the magistrate was correct; and that on the disease passing away a malignant small-pox epidemic took its place. There was no difficulty here in tracing a cause. It was evident to the eye and to the nose in every town and hamlet I passed through. A baneful practice of intermural burials has been carried on, until the dust of generations has reached the doors of dwelling-houses, and accumulated high above the ground floors of the houses. The corpses are merely sprinkled over with earth; a mat is placed over the face, one end being left above ground for some days to admit of the escape of the gases. In the midst of the necropolis are wells from which the inhabitants receive their water supply. On an average 10 feet of rain falls on this coast per annum. Under these circumstances can we wonder at these outbursts of epidemics, that foul ulcers, inveterate cutaneous diseases, intestinal worms, &c., &c., are always present amongst the inhabitants? 227. In whatever mode malignant cholera passes into the frame, a poisoning of the blood immediately takes place. The profuse discharges from the stomach and bowels I view as the *vis medicatrix naturæ;* death in such cases seldom occurring under 18 to 24 hours. But where the productive causes operate with intense force, as it did in Malabar, we have the cholera *sicca*, where the secretions are arrested and the individual is struck down as if shot dead.

* I have already entered at length into the subjects referred to from query 1 to 17 of this head.

INSPECT.-GEN. MACPHERSON'S REPORT. MADRAS.

STATIONS.	REPLIES.
VI. STATE OF BARRACKS.	What means can we adopt to render the climate of the plains as little injurious as possible to those whom necessity compels us to keep there?
	228. Every young engineer officer should attend a course of hygiène at the new Military Medical College, Chatham, before he joins his corps. As a rule in the construction of barracks, &c., I am constrained to say that, so far as my experience goes, sanitary considerations are about the last subject that receive their attention.
	229. Before the foundations of a proposed range of buildings are dug, a ground plan for deep and surface drainage should be prepared, and the barracks erected accordingly. The next step should be to provide latrines for the workmen, pits with cross boards and temporary roofs; lime or charcoal, with earth to be thrown into these once or twice a week; and fresh pits to be opened so soon as the accumulations below have risen to three feet from the cross planks. My observations at paragraph 172, exemplifies the evil results occurring on the accumulation of vegetation and surface filth during the erection of great public buildings.
	230. Ranges of barracks should always be built *en echelon*, and furnished with open verandahs on both sides, the upper portions of which should have fixed open venetians or jalousies. The floor of the barrack should always be raised 18 to 24 inches, or, what is still better, on low arches. The cubical space considered requisite for each man is 1,000 feet; but it of course makes all the difference whether this space is arranged perpendicularly or laterally. The present style of barrack building is to make the rooms exceedingly lofty, as at Bangalore, where really the climate is excellent. The consequence is that the lateral dimensions are comparatively contracted, and the men's beds will be in close proximity to each other. This injudicious arrangement is a pity, because expense is incurred without a corresponding benefit. Again, the wings to the barracks, which open into the rooms, and are, in fact, like the aisles of a church, are fitted up for the reception of saddlery and horse equipments, a bad arrangement for India.
	
	231. The walls and ceilings of barracks should be thoroughly cleansed every quarter, and whitewashed every half year. Lavatories, kitchens, latrines, and urinals should undergo the process of cleaning every month, and whitewashing every quarter. All solid and liquid refuse of barracks should be removed in carts to a distance. This is the only true way of retaining the position sweet. These apartments should be provided with ingress for air below, and free roof ventilation. Cooking places should be constructed of one long furnace, with chimney at the end, as in the sketch, by which fuel is economized and dirt and smoke prevented. Kitchen ranges after this plan, introduced by Surgeon Duff, of this army, are now coming into general use in private dwelling houses. They should be introduced in all barracks and hospitals.
	232. Military bazaars require as much, or even more, care in their construction and subsequent conservancy as military barracks. Once formed, they grow in size rapidly. Too often the nidus of disease lurks here, to be called forth on any exciting cause. Drainage should be well considered, houses should be constructed on a distinct plan, and made uniform, as well as can be, with streets, so formed as to admit of free ventilation.
	233. The question of the best positions for European soldiers in India is one of vital importance, and can only be satisfactorily decided by minute examination, by competent parties, of the various localities, and by earnest endeavours to reconcile military and sanitary considerations.
VII. HOSPITALS.	234. In addition to the observations made under the last head, which are all applicable to the subject of this, I may state that the lavatory, urinal, and privy arrangements in our hospitals generally are very defective. The high prison-like wall which we usually find surrounding our hospitals as well as our barracks, should in all instances be removed and give place to a dwarf wall, surmounted by a rail. A day room should be attached to every hospital, provided with chess and draught boards, &c., light reading, tables and couches, to which the convalescent could proceed during the day, instead of passing his whole 24 hours, as he now does, in his bed. This room would also serve as a refectory, or convalescents might have their meals in the verandah. Anything is preferable to the present system of taking his food on his knee, seated on his bed, possibly with dying men around him. An ambulance to enable convalescents to get morning and evening exercise by taking them to the country, where they could get out and walk, ought to be attached to each hospital.
Beds and Bedding.	235. The sooner wooden beds are banished from our hospitals the better. They are objectionable in every way; clumsy, difficult to keep clean, and, worse than all, they harbour vermin. The last is a very serious evil, for it adds to the sufferings of a sick man. I know no sight more piteous than that of a patient suffering under a fractured limb disturbed, fevered, and tormented during a long night by voracious insects crawling about the injured extremity. Every wooden cot should be destroyed, and light iron frames substituted.* There is also great room for improvement in the bedding. The quilts afford a most imperfect protection to the sick soldier from the damp and cold, particularly during the rains and in damp climates. The quilts are not quilted at all; they consist of little more than a piece of blue and white cloth, stitched together. In many hospitals this is all he has below him, with a similar covering for his person. A good mattrass, a blanket, sheets, and pillow slips should be provided for every bed in hospital.
Utensils.	236. The present night chairs are open to great objections. In a large military hospital, during an epidemic of dysentery, it is the present practice to keep in an open verandah, or at the bed-side of the patient, the secretions from the bowels of patients labour-

* I have striven for upwards of four years to obtain iron beds of an improved pattern for the European troops in this Presidency, but with very limited success.—P. G.

STATIONS.	REPLIES.
VII. Hospitals—*cont.*	ing under this disease for the inspection of the medical attendant. The objectionable construction of the night chair permits the fetor to escape, so a privy atmosphere of the most pestilential kind pervades the whole place. I have long been assured that evil consequences follow on this practice. I have seen fever patients and others exposed to these emanations, smitten with the prevailing epidemic in its most putrid form; and my opinion has been strengthened by the researches into this question of the late Dr. Budd, who has shown how diseases are propagated in this way. It would be easy to correct the evil, either by receiving the evacuations in a vessel containing a saturated solution of some of the chlorides, by having a room to place them in, or by substituting for the present a more appropriate air-tight vessel.
VIII. INSTRUCTION AND RECREATION.	237. Throughout this report, when an opportunity presented, I have urged the introduction into all our regiments of a system not only of instruction and recreation, but also of trades. To the soldier in times of peace "idleness is certainly the bane of all evil." In the useful arts there is not a regiment which could not furnish tinmen, watch-makers, bookbinders, printers, gun-makers, saddlers, tailors, shoemakers, and various other trades. They could manufacture their own accoutrements, as well as supply the public with many useful articles, and, as gardeners, their own mess, at any rate, would be secured with a sufficient supply of the articles of diet, which they so much stand in need of at every station. The establishment of Government workshops in this manner would be a vast saving to the State. I would also make the soldiers' wives industrious by encouraging them to employ their time as dress-makers, in needle and fancy work, by appointing periods for the sale of these articles, and giving prizes to the most deserving. The arrangements to be under the superintendence of a committee of ladies and gentlemen at the station. 238. In the hot season, one hour's drill in the morning, and occasionally in the evening, for a like period, ought to be sufficient; and at this period marching parades are, perhaps, the least harassing. The usual means of recreation, such as cricket, skittle and ball grounds, gymnasia, theatres, &c., should be encouraged. The institution of savings' banks would be advantageous, and in the neighbourhood of the men's barracks there should be sufficient shade from trees to enable soldiers to take exercise, without injury to health, during the day.
IX. AMBULANCE.	239. Our present arrangements for the conveyance of hospital equipments and for the transport of troops, in health and sickness, are very faulty. The subject has engaged much of my attention lately, and I have submitted elaborate reports to Government urging the introduction of an entirely new system, which, it is acknowledged by the authorities, would combine efficiency and much economy. I refer the Royal Commissioners to the published printed proceedings of Government, noted in the margin. Wherein will be found in detail the old arrangements, as also those recommended to be adopted by me in this presidency, for field hospitals, ambulances, transport of sick, and hospital supplies. No. 4,450, dated 8th December 1857. No. 992, „ 18th March 1858. No. 3,921, „ 14th September 1858. No. 2,221, „ 15th June 1860.
X. BURIAL OF THE DEAD.	240. The graveyards in many of our military cantonments are not sufficiently removed from the abodes of the living. At Secunderabad two large graveyards adjoin the European barracks; and there is another in the centre of the cantonment. At the convalescent depôt of Ramandroog the graveyard is placed on the summit of the plateau, about 150 yards from the married men's quarters. The surface is so hard that blasting with powder is necessary before sufficient depth can be secured. The position is highly objectionable. An excellent spot is available down the slope of the hill, to which it ought to be removed. I would recommend that no native burning or burial ground should approach nearer than three miles of a military cantonment; and what is equally, if not more, necessary, that public latrines should be erected contiguous to all native towns and bazaars. At present many of the native burial-grounds border on our cantonments, whose outskirts are also too often promiscuously defiled with human ordure and other offal, which is not only a perfect nuisance, but highly objectionable, as regards the salubrity of our stations.
XI. RETURNS AND REPORTS.	241. The voluminous returns demanded from all hospital establishments, and the amount of scriptory labour in preparing these, demands reform. A regimental surgeon is obliged to make out five occasional, three daily, three weekly, thirty monthly, one quarterly, two half-yearly, and thirty-five annual returns; and the civil surgeon has others besides; copies of all having to be kept for record in hospital. It would materially facilitate public duty were one class of returns made applicable for the army at home and in India; and if blank printed forms of these were issued to medical officers, corresponding forms being bound up into volumes, to be filled up when copies are to be retained. So far as I am aware, none of our returns exhibit the sickness and mortality of soldiers' wives and children, nor are there mortuary tables of the civil population generally.
XII. DUTIES OF MEDICAL OFFICERS.	242. In no army in the world are young men entrusted with responsibility at so early a period in their career as in this. It follows, therefore, that nowhere ought more vigilance to be exercised than in the selection of those whose duty it is to support and direct them in the discharge of their difficult duties. Their moral as well as their professional qualifications should not be open to question. 243. Every one of us must remember the anxieties we experienced in the early days of our career, when we suddenly found ourselves in the sole charge of a large body of officers and men, whose lives were, without appeal, in our hands, and, if we speak the truth, most of us must confess that we have purchased our experience dearly. 244. I am deeply impressed with the conviction that the principle of selection for the administrative offices in the service should be very rigidly enforced; and I am strongly of opinion that the duty of aiding our young medical officers, by placing over them men capable of guiding and advising them, has been too much neglected. What we require is, a man to whom the young physician can look up, not merely as an official superior, but an experienced counsellor to whom he can resort with confidence in the hour of difficulty. 245. The importance of judicious inspections cannot be overrated. With the area of this vast presidency to inspect, including the Pegue division and our stations in the Straits of Malacca, it will hardly be possible for the Inspector-General of this army to re-visit a station sooner than every third year. I am now completing the third year of my office, during which

INSPECT.-GEN. MACPHERSON'S REPORT. MADRAS.

STATIONS.	REPLIES.
XII. Duties of Medical Officers —*cont.*	period I have travelled, without ceasing, by land, upwards of 9,000 miles, at the average rate of three miles an hour, and have visited the Straits, but the Pegue division has yet to be inspected. Deputy inspectors of divisions should pay as much attention to detached stations and sanitaria as to the cantonments under their immediate observation, by journeys over the circle of their superintendence at different seasons of the year. It would advance the interest of the service were their appointments made to terminate in five years after election.

CONCLUSION.

246. Having concluded my remarks on the more important subjects referred to in the foregoing list of queries, it only now remains for me to beg the indulgence of the Royal Commissioners for the prolixity of my observations, rendered to some extent necessary by the vast range of topics it was necessary for me to enter upon. I am very sure that the records of this army contain, although, perhaps, in a fragmentary state, all that I have endeavoured to bring into one view; but the observations even of the most experienced professional men in all that relates to the sanitary condition of the army, have not always met with that regard which was due to them, or they have been attended to only when the pressure of some epidemic created a panic.

247. Even in England, the last place where sanitary considerations obtained a hearing was in those influential quarters where rests the highest military authority. The terrible ordeal of the Crimea came and laid bare to the world the defects of our system. At first the whole current of the public indignation was directed against the medical department, but the report of the Royal Commission appeared, and its terrible disclosures shocked the moral sense of the whole nation. They were aware of the wasteful expenditure of life in the Crimean war, but they were unprepared to find that in England, the healthiest country in the world, the occupation of a soldier in times of the profoundest peace stood at the bottom of the list of unhealthy occupations. Her Majesty's Commissioners therein further observed, that the blame did not rest with the medical department, whose officers had never ceased to protest against a system that brought discredit on themselves, enormous losses to the State, and death to its most faithful guardians.

248. I respectfully submit, that it is for us to profit by this great example, and to hasten to amend what is faulty in our system here. By giving a better direction to prevent expenditure, half the evils pointed out may be remedied. If it is anywhere proved that a system now in operation tends to the destruction of health, it then becomes incumbent on those who support it to demonstrate that considerations of the most urgent state necessity demand its continuance. But even then, how much can be done to mitigate the unavoidable evil! For example, what strong military considerations exist for quartering the depôts for European soldiers at the hottest stations within the limits of the Presidency, and one that is most frequently visited by terrible epidemics of cholera? In a word, I solicit attention to what I have advanced with a view to earnest endeavours to prevent disease, to remove its remediable causes, and thus directly to promote the moral and physical well-being of those who have such high claims on the State they serve; and I am well assured that in the end the State will reap a rich reward in the increased health, happiness, and efficiency which will result from such well-directed efforts.

DUNCAN MACPHERSON, M.D.,
Inspector-General of Hospitals,
Her Majesty's Madras Army.

Inspector-General o Hospitals Office,
Madras, 27th December 1860.

N.B.—If deemed necessary, I can hereafter transmit a supplementary report on the Pegue division and the Straits of Malacca.

APPENDIX A.

INDEX to the REPLY by INSPECTOR-GENERAL Dr. D. MACPHERSON, and TABLE exhibiting the SICKNESS and MORTALITY of the CIVIL and MILITARY ESTABLISHMENTS in the MADRAS PRESIDENCY during TWELVE MONTHS prior to the date of his INSPECTION of the several STATIONS.

Para.	Station.	Military Force and Civil Department.	Strength.	Prevailing Diseases.																				Average Daily Sick.	Ratio of Deaths to Strength per Cent.	Ratio of Deaths to Sick per Cent.
				Fever.		Lungs.		Liver.		Stomach and Bowels.		Brain.		Rheumatism.		Venereal.		Cholera.		Other Diseases.		Total.				
				Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.			
1	CHINGLEPUT	Jail Hospital	258	84	—	2	—	—	—	29	—	6	—	7	—	3	—	4	1	118	1	253	2	2¾	0·77	0·79
		Civil Dispensary	—	127	—	52	—	1	—	3,907	2	130	—	532	—	125	1	9	5	4,012	6	8,895	14	24	—	0·16
3	CUDDALORE	European Garrison	81	1	—	3	—	11	1	11	3	4	—	5	1	10	—	1	1	63	—	109	6	9¼	7·40	5·50
		Native Garrison	267	17	2	9	1	1	—	6	1	—	—	24	—	—	—	5	3	33	3	95	10	8¾	3·74	10·52
		Civil Hospital and Dispensary	—	1,417	1	220	—	26	—	9,107	—	200	—	709	—	734	—	82	23	4,388	11	16,873	36	102½	—	0·21
6	TRICHINOPOLY	European Garrison	781	286	1	82	—	45	2	307	2	83	2	60	—	328	—	12	3	475	2	1,678	12	82	1·53	0·71
		Native Garrison	2,079	551	1	36	2	9	—	163	4	20	1	186	—	64	—	28	11	832	6	1,889	25	58	1·20	1·32
15	TANJORE	European Garrison	58	9	—	3	—	1	—	7	1	3	—	1	—	7	—	—	—	19	—	50	1	3	1·72	2·
		Native Garrison	230	46	—	4	—	—	—	3	—	3	—	18	—	2	—	2	1	30	2	108	3	3¾	1·30	2·77
		" "	148	13	—	2	—	—	—	8	—	—	—	16	—	2	—	1	1	39	—	81	1	4	0·67	1·23
16	COMBOCONUM	Jail Hospital	174	154	1	3	—	—	—	271	16	3	1	29	—	6	—	4	2	155	5	625	25	10	14·36	4·0
		Civil Hospital and Dispensary	—	209	—	108	1	9	—	1,324	3	96	—	348	—	249	1	29	—	2,244	7	4,616	12	80	—	0·25
17	NEGAPATAM	Native Garrison	188	28	—	1	—	—	—	7	—	—	—	6	—	2	—	—	—	11	—	65	—	4	—	—
		Jail Hospital	54	64	—	7	1	—	—	45	4	—	—	4	—	—	—	1	—	48	6	169	11	6	20·37	6·50
18	TRANQUBAR	Native Garrison	180	16	—	—	—	—	—	18	—	—	—	7	—	2	—	1	—	32	—	76	—	2	—	—
		Jail Hospital	31	3	—	2	—	—	—	22	1	—	—	5	1	—	—	1	—	16	2	49	4	¾	12·90	8·16
19	MADURA	" "	219	86	2	2	—	—	—	85	8	5	2	14	—	2	—	24	13	196	7	414	32	1¼	14·61	7·72
		Civil Hospital and Dispensary	—	37	1	11	2	—	—	48	1	23	1	68	1	68	1	—	—	249	17	504	24	1	—	4·76
20	TINNEVELLY and PALAMCOTTAH.	Native Garrison	768	116	3	13	1	1	—	56	2	6	1	67	2	19	1	2	—	215	2	495	12	18	1·56	2·42
		Jail Hospital	231	77	—	1	1	—	—	61	9	2	—	3	—	1	—	2	2	52	2	199	14	17	6·06	7·03
		Civil Hospital and Dispensary	—	5	1	6	—	1	1	34	6	3	—	12	—	41	—	1	1	115	8	218	17	25	—	7·79
21	QUILON	Native Garrison	785	116	1	27	—	3	1	34	—	4	—	113	1	11	—	1	—	403	—	712	3	38	0·38	0·42
22	COCHIN	" "	258	61	—	6	—	1	1	26	—	3	—	40	—	9	—	1	—	122	—	269	1	5	0·38	0·37
23	CALICUT	European Garrison	105	—	—	2	—	—	—	2	—	—	—	2	—	4	—	—	—	5	—	15	—	3	—	—
		Native Garrison	208	9	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	20	—	31	—	2	—	—
24	MULLIAPOORUM	European Garrison	145	4	—	3	1	1	—	29	2	—	—	1	—	6	—	—	—	9	—	53	3	2½	2·06	5·66
25	TELLICHERRY	Native Garrison	85	8	1	5	—	—	—	7	—	—	—	11	—	—	—	—	—	18	1	49	2	2	2·35	4·08
		Jail Hospital	157	59	1	4	1	—	—	29	3	2	—	7	—	7	—	—	—	85	8	193	13	3	8·28	6·73
		Civil Hospital and Dispensary	—	201	—	38	—	1	—	350	—	31	1	40	—	21	—	—	—	232	6	914	7	18	—	0·76
26	CANNANORE	European Garrison	601	9	—	17	1	—	—	60	—	1	—	17	—	40	—	—	—	128	—	273	1	5	0·16	0·37
		Native Garrison	1,860	726	2	47	4	4	1	91	6	7	1	179	—	44	—	—	—	379	6	970	22	7¾	1·18	2·26
30	COIMBATORE	" "	114	54	—	2	1	—	—	23	—	1	—	11	—	10	—	3	—	72	—	176	1	5½	0·87	0·56
		Jail Hospital	418	53	3	5	2	—	—	79	11	4	1	8	—	6	—	7	5	95	5	257	27	9¾	6·45	10·50
		Civil Hospital and Dispensary	—	841	3	90	3	2	1	1,281	9	100	—	291	—	94	—	70	30	3,077	19	5,846	65	103	—	1·11

Appendix A.—Index to the Reply by Inspector-General Dr. D. Macpherson, and Table exhibiting the Sickness and Mortality of the Civil and Military Establishments in the Madras Presidency—*cont.*

Para.	Station.	Military Force and Civil Department.	Strength.	Prevailing Diseases.																				Average Daily Sick.	Ratio of Deaths to Strength per Cent.	Ratio of Deaths to Sick per Cent.
				Fever.		Lungs.		Liver.		Stomach and Bowels.		Brain.		Rheumatism.		Venereal.		Cholera.		Other Diseases.		Total.				
				Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.			
31	Salem	Native Garrison	259	12	2	3	—	—	—	5	2	3	2	9	1	1	—	1	1	15	1	49	9	6	3·47	18·3
		Jail Hospital	223	61	3	6	—	—	—	57	15	3	—	9	—	9	—	87	47	176	14	408	79	16	35·87	19·36
		Civil Hospital and Dispensary	—	335	2	59	—	2	—	460	13	36	—	164	—	126	—	95	30	1,523	10	2,800	55	43	—	1·96
32	Vellore	European Garrison	248	9	1	5	3	—	—	13	2	8	1	16	1	5	—	10	—	32	2	98	10	14⅔	5·86	10·20
		Native Garrison	1,277	306	1	13	—	—	—	84	3	3	1	133	—	38	—	44	24	346	2	967	32	52⅔	2·40	3·30
		Civil Hospital and Dispensary	—	474	—	89	1	2	—	1,561	5	115	1	338	3	452	—	20	8	2,170	12	5,281	30	9	—	0·48
33	Chittoor	Native Garrison	219	20	1	12	2	—	—	11	1	2	1	19	—	3	—	5	—	30	—	102	5	6	2·28	4·90
		Jail Hospital	363	41	1	9	1	1	—	20	2	4	1	9	1	9	—	14	9	125	4	232	19	6½	5·23	8·18
		Civil Hospital and Dispensary	—	1,160	1	165	2	1	—	3,327	1	358	—	407	—	116	—	32	8	2,162	9	7,819	21	72	—	0·48
34	Arcot	European Garrison	318	7	—	12	1	4	—	28	1	2	—	2	—	31	—	—	—	21	—	107	2	4	0·62	1·66
		Native Garrison	1,233	92	1	15	1	—	—	29	1	2	—	29	—	12	—	8	5	156	3	343	11	16½	0·89	3·20
37	Poonamallee	European Garrison	106	11	—	17	1	24	1	33	1	7	—	11	—	26	—	—	—	55	1	184	4	10	3·77	2·6
40	Palaveram	Native Garrison	663	313	15	66	2	—	—	201	23	23	—	233	5	39	—	—	—	574	16	1,449	61	153	9·20	4·2
41	Saint Thomas's Mount	European Garrison	315	226	3	40	3	12	—	120	2	39	1	36	2	68	—	5	1	230	—	776	12	59	3·80	1·6
		Native Garrison	534	79	—	21	2	1	—	75	5	14	—	35	—	36	—	7	4	173	4	441	15	23	2·80	3·40
42	Madras	European Garrison	1,096	763	7	187	10	74	4	432	19	59	3	85	1	460	—	15	9	855	26	2,885	79	134½	7·20	2·73
		Native Garrison	4,132	535	8	102	6	14	1	204	15	50	3	267	1	214	1	13	10	1,529	11	3,166	54	108¼	1·30	1·70
		Jail Hospitals	266	61	—	8	—	1	—	83	4	8	—	22	—	51	2	39	19	94	4	367	29	15⅔	10·90	7·90
		Civil Hospitals and Dispensaries	—	3,644	15	1,900	36	135	6	17,793	102	620	15	2,854	10	2,196	26	220	95	34,240	255	54,682	565	1,678¾	—	1·03
49	Bangalore	European Garrison	1,752	929	20	114	7	105	5	767	37	106	16	224	1	729	3	161	92	1,222	43	4,357	226	137	12·89	5·18
		Native Garrison	1,900	868	5	68	3	2	—	146	8	31	—	151	—	127	1	23	11	651	7	2,098	35	112¼	1·84	1·66
		Lock Hospital	—	—	—	—	—	—	—	—	—	—	—	—	—	97	—	—	—	—	—	97	—	15	—	—
61	Hoonsoor	Native Garrison and Public Cattle Depôt.	1,271	161	2	3	—	—	—	10	1	7	—	8	—	8	—	13	8	10	4	320	15	10½	1·17	4·68
62	Mercara	Native Garrison	687	223	5	15	1	—	—	103	4	4	—	63	—	16	—	14	4	250	4	688	18	23	2·62	1·61
64	Jaulnah	European Garrison	536	736	5	21	2	29	—	127	3	25	1	36	—	140	—	27	15	148	1	1,289	27	110¼	5·03	2·09
		Native Garrison	1,330	209	1	22	3	7	1	15	3	9	2	54	1	97	—	17	2	268	2	738	15	36½	1·12	2·03
67	Nagpore	European Garrison	529	104	1	22	—	10	—	104	3	15	1	16	—	81	1	—	—	139	—	491	6	28	1·13	1·22
		Native Garrison	2,782	832	6	64	4	10	2	171	4	25	—	238	1	109	—	1	1	817	7	2,267	25	104	0·89	1·10
		Civil Hospital and Dispensary	—	278	—	37	2	3	—	461	11	11	1	94	2	104	1	1	—	486	15	1,474	32	73	—	2·17
77	Secunderabad	European Garrison	1,767	779	23	198	10	170	15	1,241	64	24	3	102	1	9	—	—	—	174	1	3,145	117	144	6·62	3·72
		Native Garrison	736	452	2	25	—	—	—	79	5	14	1	120	—	40	—	—	—	412	7	1,142	15	68	2·03	1·31
92	Masulipatam	„ „	734	189	5	12	1	5	—	43	5	15	—	27	—	29	—	1	1	182	3	501	15	27¼	2·04	2·99
		Civil Hospital and Dispensary	—	530	—	104	—	6	1	1,019	1	47	1	270	—	96	1	109	19	1,150	4	3,331	27	46	—	0·81
93	Guntoor	Native Garrison	316	23	1	13	1	—	—	3	—	3	—	21	—	2	—	—	—	47	5	112	7	8	2·21	6·24
		Civil Hospital and Dispensary	—	517	3	113	1	—	—	940	1	58	1	414	—	68	2	—	—	1,445	4	3,555	13	56¾	—	0·36
94	Nellore	Native Garrison	332	23	—	1	1	—	—	8	3	2	1	15	1	—	—	1	—	28	4	78	10	6	3·01	12·87
		Jail Hospital	318	49	2	2	—	—	—	19	—	4	1	3	—	5	1	3	2	22	—	107	6	3½	1·88	5·91
		Civil Hospital and Dispensary	—	409	3	170	7	2	—	898	19	86	4	367	6	513	1	11	4	1,482	34	3,938	78	107½	—	1·99

Appendix A.—Index to the Reply by Inspector-General Dr. D. Macpherson, and Table exhibiting the Sickness and Mortality of the Civil and Military Establishments in the Madras Presidency—*cont.*

Para.	Station.	Military Force and Civil Department.	Strength.	Prevailing Diseases.																		Average Daily Sick.	Ratio of Deaths to Strength per Cent.	Ratio of Deaths to Sick per Cent.
				Fever.		Lungs.		Liver.		Stomach and Bowels.		Brain.		Rheumatism.		Venereal.		Cholera.		Other Diseases.		Total.				
				Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.			
95	Bezwarrah	District Engineers Department	3,000	95	1	14	—	6	—	179	—	—	—	25	—	9	—	3	2	98	2	429	5	1½	0·16	1·16
96	Dowlaishweram	Native Garrison	591	209	2	17	1	2	1	24	1	3	—	95	2	83	—	—	—	484	5	920	14	22	2·36	1·52
97	Rajahmundry	Civil Hospital and Dispensary	—	401	1	112	3	6	—	924	4	99	2	276	2	345	—	1	—	1,506	19	3,670	31	171	—	0·75
98	Samulcottah	Native Garrison	1,150	307	1	35	—	2	—	61	1	12	1	129	4	80	1	—	—	436	—	1,062	8	49	0·006	0·007
99	Coconada	Civil Hospital and Dispensary	—	108	—	30	—	8	—	831	4	11	1	66	—	75	—	10	1	358	5	1,298	11	21¼	—	0·84
100	Vizagapatam	European Garrison	382	30	2	12	—	8	—	29	4	26	6	29	—	39	1	—	—	143	4	317	17	25¼	4·45	5·36
		Native Garrison	1,094	236	2	26	3	—	—	60	1	6	—	75	—	36	—	—	—	239	1	738	7	20¼	0·63	0·94
		Jail Hospital	174	41	3	6	1	1	—	20	3	—	—	8	1	1	—	—	—	141	1	218	9	6	5·14	4·12
		Civil Hospital and Dispensary	—	1,017	—	209	1	4	1	2,311	1	94	2	406	—	178	1	—	—	2,016	10	6,235	13	64	—	0·20
101	Vizianagrum	Native Garrison	833	163	—	19	1	—	—	54	1	5	—	117	2	54	—	—	—	234	2	649	6	5	0·72	0·92
102	Chicacole	" "	1,598	300	2	11	1	1	—	33	—	12	—	26	—	25	—	—	—	341	4	949	7	14⅓	0·43	0·73
		Jail Hospital	162	8	—	1	—	—	—	7	4	1	—	—	—	2	—	—	—	12	2	31	6	4	3·70	19·3
		Civil Hospital and Dispensary	—	766	—	170	—	—	—	1,339	—	378	—	626	—	163	—	—	—	1,499	5	4,941	5	93⅓	—	1·10
103	Russelcondah	Native Garrison	1,088	422	2	6	—	1	—	50	1	9	—	55	—	33	—	—	—	207	—	833	3	10½	0·27	0·36
104	Cuttack	" "	928	471	6	48	—	3	—	56	2	18	1	119	—	48	—	—	—	316	—	1,073	9	32	0·96	0·83
105	Bellary	European Garrison	929	240	1	70	6	40	3	194	8	11	—	31	—	230	—	4	1	381	8	1,165	27	49	2·90	2·65
		Native Garrison	1,920	453	1	18	2	5	1	95	2	6	—	99	—	91	—	104	55	340	4	1,210	65	43⅔	3·38	5·37
		" "	1,080	318	2	33	1	2	—	74	—	3	—	76	2	36	—	38	18	265	1	845	24	22¾	2·22	2·84
110	Kurnool	Jail Hospital	118	20	1	1	1	—	—	48	2	1	—	3	—	3	—	14	5	79	—	170	9	4½	7·62	5·29
		Civil Hospital and Dispensary	—	546	—	124	1	3	1	1,666	2	32	—	828	—	917	—	54	15	3,283	4	6,638	23	59¼	—	11·25
		Native Garrison	1,015	679	3	5	—	1	1	16	2	9	—	37	—	85	—	14	3	301	—	1,147	9	55½	0·88	0·75
111	Cuddapah	Jail Hospital	392	178	11	2	2	—	—	34	10	3	1	—	—	1	—	29	21	154	4	401	49	7¾	12·5	12·19
		Civil Hospital and Dispensary	—	1,221	2	97	—	10	—	845	5	60	1	231	—	203	4	91	25	1,626	17	4,324	54	67½	—	1·25

APPENDIX B.—General Table, exhibiting the SICKNESS and MORTALITY from the most important DISEASES amongst the EUROPEAN TROOPS of the MADRAS ARMY for 15 Years, from 1842 to 1856–7, contrasted with the Results of 1857–8.

Years.	Strength.	Cholera.		Fevers.		Liver.		Diarrhœa.		Dysentery.		Thoracic.		Rheumatism.		Venereal.		Dropsy.		Total of preceding Diseases.		General Total of all Diseases.		Per-centage of				
		Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Sick to Strength from 9 principal Diseases.	Death to Strength from 9 principal Diseases.	Sick to Strength from all Diseases.	Deaths to Strength from all Diseases.	Deaths to Strength, excluding those from Cholera.
1842	12,080	335	163	3,137	26	991	34	1,683	37	1,912	121	194	20	1,171	7	2,414	5	43	8	11,880	421	19,490	508	98·3	3·4	191·3	4·2	2·8
1843	12,436	448	206	4,031	50	911	36	1,663	37	2,008	158	381	27	1,171	5	2,188	7	49	11	12,850	537	21,676	610	103·3	4·3	174·3	4·9	3·2
1844	13,057	111	54	3,431	53	811	23	1,333	20	1,360	89	387	21	1,248	5	2,099	3	35	7	10,815	275	19,291	367	82·8	2·1	147·7	2·8	2·3
1845	12,548	232	124	3,971	52	930	50	1,447	27	1,625	102	179	21	1,048	9	2,470	7	31	8	11,933	400	20,396	941	95·09	3·1	162·5	3·9	2·9
1846	11,113	146	75	2,966	36	827	40	949	17	1,439	98	147	16	882	10	2,332	8	30	8	9,718	308	16,641	402	87·4	2·7	149·7	3·6	2·9
1847	11,429	32	22	2,710	30	740	41	1,292	14	1,346	116	236	28	1,047	4	3,401	4	30	1	10,834	260	17,895	337	94·7	2·2	156·5	2·9	2·7
1848	9,679½	3	2	2,677	23	701	13	822	9	841	50	1,288	25	1,064	5	3,484	5	30	9	10,910	141	17,290	174	112·7	1·4	178·6	1·7	1·7
1849	9,559	43	26	2,807	12	625	32	884	19	905	72	967	34	967	2	3,091	5	22	2	10,311	204	15,589	245	107·8	2·1	163·08	2·5	2·2
1850–1	9,136½	35	21	2,932	14	626	28	659	9	704	45	971	45	932	4	2,675	7	18	5	9,552	178	14,646	226	104·5	1·9	160·3	2·4	2·2
1851–2	9,119	25	15	2,257	14	644	27	657	5	1,011	71	920	37	924	3	2,479	6	14	8	8,931	186	14,091	216	97·9	2·03	154·5	2·3	2·2
1852–3	9,170½	253	155	3,719	53	633	32	1,412	30	1,413	109	925	31	967	3	1,975	4	53	8	11,350	425	16,911	478	123·7	4·6	184·4	5·2	3·5
1853–4	8,291	121	61	2,674	29	585	27	1,241	12	1,085	91	900	30	959	3	1,926	1	34	7	9,525	261	14,853	324	114·8	3·1	179·1	3·9	3·1
1854–5	9,021	131	65	3,287	29	500	31	1,154	11	923	72	727	28	955	4	2,431	3	24	9	10,182	252	15,465	300	112·8	2·7	171·4	3·3	2·6
1855–6	7,599	25	11	2,494	20	633	34	805	11	865	62	551	24	732	2	2,225	0	12	2	8,342	166	12,308	200	109·7	2·1	161·9	2·6	2·4
1856–7	7,513	136	58	2,127	11	530	18	723	8	686	46	753	22	722	1	1,949	2	14	5	7,640	171	11,526	215	101·6	2·2	153·4	2·8	2·08
Total	151,751½	2,076	1,058	45,220	452	10,687	466	16,724	266	18,123	1,302	9,576	409	14,789	67	37,139	67	439	98	154,778	4,185	248,068	5,093	101·9	2·7	163·4	3·2	2·6
Per-centage of treated to Strength		1·3		29·7		7·04		11·02		11·9		6·3		9·7		24·4		0·2		101·9		163·4						
Do. Deaths to do.		0·6		0·2		0·3		0·1		0·8		0·2		0·04		0·04		0·06		2·7		3·2						
Do. do. to treated		50·9		0·9		4·3		1·5		7·1		4·2		0·4		0·1		22·3		2·7		2·05						
For 1857–8	9,396	245	112	3,061	36	567	27	1,306	15	871	60	773	31	755	7	2,434	3	19	6	10,031	297	15,591	385					
Per-centage of treated to Strength		2·6		32·5		6·03		13·8		9·2		8·2		8·03		25·9		0·2		106·7		165·9						
Do. Deaths to do.		1·1		0·3		0·2		0·1		0·6		0·3		0·07		0·03		0·06		3·1		4·09						
Do. do. to treated		45·7		1·1		4·7		1·1		6·8		4·01		0·9		0·1		31·5		2·9		2·4						

APPENDIX C.—AVERAGE DEATH RATE in the under-mentioned CORPS in 1859–60.

	Wellington, H.M. 60th Rifles.	Bangalore, 1st Royal Dragoon Guards.	St. Thomas's Mount, Artillery.	Secunderabad, H. M. 1st Royal Regiment.	Bellary, H. M. 74th Regiment.	Kamptee, H. M. 9th Regiment.	Secunderabad, H. M. 18th Regiment.	Secunderabad, H. M. 17th Lancers.
Strength	1,137	586	590	1,045	812	819	961	448
Average Death Rate per Cent.	0·87	1·19	2·37	2·39	2·58	2·80	3·53	11·60

APPENDIX D.

GENERAL TABLE exhibiting the SICKNESS and MORTALITY in each DIVISION of the MADRAS ARMY for 15 Years, from 1842 to 1856-7, contrasted with the Results of 1857-8.

Divisions.	Europeans.																Natives.											
	1842 to 1856-7.								1857-8.								1842 to 1856-7.								1857-8.			
	Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.	Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.	Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.	Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.
Presidency	15,780	24,363	436	77	154·3	2·7	2·2	1·7	285	419	3	—	147·01	1·05	1·05	0·7	43,255½	28,416	809	340	65·6	1·8	1·08	2·8	1,612	1,475	17	9	91·5	1·05	0·4	1·1
Centre	20,790½	30,861	882	187	148·4	4·2	3·3	2·8	668	1,807	38	4	270·5	5·6	5·08	2·1	57,732½	35,400	1,242	331	61·3	2·1	1·5	3·5	2,798	3,352	123	35	119·7	4·3	3·1	3·6
Southern	14,221¾	25,531	424	108	179·5	2·9	2·2	1·6	491	922	11	2	187·7	2·2	1·8	1·1	78,646½	61,003	1,665	976	77·5	2·1	0·8	2·7	4,001	3,414	45	12	85·3	1·1	0·8	1·3
Mysore	25,586½	35,354	581	157	138·1	2·2	1·6	1·6	931	1,579	8	—	169·6	0·8	0·8	0·5	83,137½	65,178	1,500	769	78·3	1·8	0·8	2·3	3,095	3,157	54	18	102·003	1·7	1·1	1·7
Malabar and Canara	14,441½	22,237	326	15	153·9	2·2	2·1	1·4	722	882	9	—	122·1	1·2	1·2	1·02	49,389½	29,903	482	61	60·5	0·9	0·8	1·6	2,673	1,633	29	—	61·09	1·08	1·08	1·7
Ceded Districts	10,400½	17,957	359	201	172·6	3·4	1·5	1·9	569	628	10	—	110·3	1·7	1·7	1·5	56,437½	41,783	937	488	74·0	1·6	0·7	2·2	2,816	3,119	27	4	110·7	0·9	0·8	0·8
Hyderabad Subsidiary Force	19,984½	36,334	688	56	181·8	3·4	3·1	1·8	540	890	10	—	164·8	1·8	1·8	1·1	118,661½	89,937	1,904	1,028	75·7	1·6	0·7	2·1	3,822	3,505	31	—	91·7	0·8	0·8	0·8
Nagpore Force	8,536¾	17,070	316	37	199·9	3·7	3·2	1·8	250	474	10	—	189·6	4·0	4·0	2·1	71,547¾	43,978	955	307	61·4	1·3	0·9	2·1	3,429	4,161	72	15	121·3	2·09	1·6	1·7
Northern (Europeans to 1851)	1,126½	901	58	—	80·01	5·1	5·1	6·4	88	194	7	2	220·4	7·9	5·6	3·6	110,310	103,026	2,178	538	93·3	1·9	1·4	2·1	6,649	7,334	127	11	117·8	1·9	1·7	1·6
Southern Mahratta Divisions (Europeans to 1846).	1,132	2,609	52	12	230·4	4·5	3·5	1·9	—	—	—	—	—	—	—	—	52,110	38,537	888	468	73·9	1·7	0·8	2·3	315	170	—	—	53·9	—	—	—
Saugor (from 1846)	1,698	3,660	46	8	216·6	2·7	2·2	1·2	2,792	4,199	65	7	150·3	2·3	2·07	1·5	58,603½	48,505	528	48	82·7	0·9	0·8	1·08	2,125	2,437	51	29	114·6	2·4	1·03	2·09
Tenasserim Provinces	5,267½	8,604	159	26	163·3	3·01	2·5	1·8	65	133	3	—	204·6	4·6	4·6	2·2	32,393½	38,055	685	60	117·4	2·1	1·8	1·8	1,500	2,244	39	—	149·6	2·6	2·6	1·7
Straits	851	944	18	—	110·9	2·1	2·1	1·9	37	118	4	—	318·9	10·8	10·8	3·3	20,609½	17,669	306	4	85·7	1·4	1·4	1·7	2,056	2,590	45	—	125·9	2·1	2·1	1·7
Aden	2,248	3,530	86	19	157·02	3·8	2·9	2·4	—	—	—	—	—	—	—	—	14,062½	9,546	253	30	67·8	1·7	1·5	2·6	—	—	—	—	—	—	—	—
China: Europeans from 1842 to 1845 / Natives from 1842 to 1847	539	1,846	27	1	342·4	5·009	4·8	1·4	—	—	—	—	—	—	—	—	11,235	24,806	993	15	220·7	8·8	8·7	4·003	450	1,867	31	—	414·8	6·8	6·8	1·6
Labuan: Europeans from June 1852 to 1855-6. / Natives from 1848	47½	123	5	—	261·7	10·6	10·6	4·06	—	—	—	—	—	—	—	—	1,183½	3,000	32	—	253·5	2·7	2·7	1·06	155	827	11	—	533·5	7·09	7·09	1·3
Bengal Presidency (from 1848 to 1850-1)	—	—	—	—	—	—	—	—	787	1,757	174	91	223·2	22·1	10·5	9·9	6,043¾	7,283	84	3	120·5	1·3	1·3	1·1	1,625	1,997	33	19	122·8	2·04	0·8	1·6
Sinde (for 1842)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	126	18	3	—	14·2	2·3	2·3	16·6	—	—	—	—	—	—	—	—
Burmah (from 1852)	9,109½	16,144	562	147	177·2	6·1	4·5	3·4	1,171	1,589	21	2	135·6	1·7	1·6	1·3	20,306½	34,893	464	71	171·8	2·2	1·4	1·3	8,781	15,055	307	23	171·4	3·4	3·2	2·03
General Hospital	—	—	68	7	—	—	—	—	—	—	12	4	—	—	—	—	—	—	185	3	—	—	—	—	—	—	30	2	—	—	—	—
Total	151,751½	248,068	5,093	1,058	163·4	3·3	2·6	2·05	9,396	15,591	385	112	165·9	4·09	2·9	2·4	885,791¾	720,938	16,093	5,540	81·3	1·8	1·1	2·2	47,902	58,837	1,072	177	122·8	2·2	1·8	1·8

APPENDIX E.

GENERAL TABLE exhibiting the STRENGTH, SICKNESS, and MORTALITY in each DIVISION of the MADRAS ARMY for 16 Years, from 1842 to 1857-8, contrasted with the Results of the Year 1858-9.

Divisions.	Europeans. From 1842 to 1857-58. Average Annual Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.
Presidency	16,065	24,782	439	77	154·2	2·7	2·2	1·7
Centre	21,458½	32,668	926	191	152·2	4·2	3·3	2·8
Southern	14,712½	25,453	485	110	179·8	2·9	2·2	1·6
Mysore	26,517½	36,983	539	157	139·2	2·2	1·6	1·5
Malabar and Canara	15,168½	23,119	335	15	152·4	2·2	2·1	1·4
Ceded Districts	10,969½	18,585	369	201	169·4	3·2	1·5	1·9
Hyderabad Subsidiary Force	20,824½	37,224	693	56	181·3	3·4	3·1	1·8
Nagpore Force	8,786½	17,544	326	37	199·6	3·7	3·1	1·8
Northern (European to 1851, and from 1857-8).	1,214½	1,095	65	2	90·1	5·3	5·1	5·9
Southern Mahratta Division (European to 1846).	1,132	2,609	52	12	230·4	4·5	3·5	1·9
Saugor (from 1846)	4,481	7,859	111	15	175·3	2·4	2·1	1·4
Tenasserim Provinces, Pegue (from 1852-3) Amalgamated in 1858-9.	15,612½	26,470	745	175	169·5	4·7	3·6	1·8
Straits	888	1,062	22	—	119·5	2·4	2·4	2·07
Aden (from 1844 to 1854-5)	2,248	3,530	86	19	157·02	3·8	2·9	2·4
China { European, from 1842 to 1845 / Natives from 1842 to 1847 and 1857-8. }	539	1,846	27	1	342·4	5·009	4·8	1·4
Labuan { European from 1852-3 to 1855-6. / Native from 1848 }	47½	123	5	—	261·7	10·6	10·6	4·06
Bengal Presidency { European for 1857-8. / Natives for 1848 to 50-1 and 1857-8. }	787	1,757	174½	91	223·2	22·1	10·5	9·9
Sinde (for 1842)	—	—	—	—	—	—	—	—
General Hospital	—	—	80	11	—	—	—	—
Total	161,147½	263,659	5,478	1,170	163·6	3·3	2·6	2·07

Divisions.	Europeans. For 1858-9. Average Annual Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.
Presidency	952	1,542	30	8	161·9	3·1	2·3	1·9
Centre	1,039	3,009	68	21	289·5	6·5	4·5	2·2
Southern	958	1,582	20	6	165·1	2·08	1·4	1·2
Mysore	1,906	2,512	28	2	131·7	1·4	1·3	1·1
Malabar and Canara	982	1,599	11	2	162·8	1·1	0·9	0·6
Ceded Districts	1,304	2,167	48	7	166·1	3·6	3·1	2·2
Hyderabad Subsidiary Force	2,047	4,547	148	—	222·1	7·2	7·2	3·2
Nagpore Force	629	738	8	—	117·3	1·2	1·2	1·08
Northern (European to 1851, and from 1857-8).	150	395	10	—	263·3	6·6	6·6	2·5
Southern Mahratta Division (European to 1846).	—	—	—	—	—	—	—	—
Saugor (from 1846)	2,587	7,098	197	—	274·3	7·6	7·6	2·7
Tenasserim Provinces, Pegue (from 1852-3) Amalgamated in 1858-9.	2,204	3,419	44	1	155·1	1·9	1·9	1·2
Straits	66	127	3	—	192·4	4·5	4·5	2·3
Aden (from 1844 to 1854-5)	—	—	—	—	—	—	—	—
China { European, from 1842 to 1845 / Natives from 1842 to 1847 and 1857-8. }	—	—	—	—	—	—	—	—
Labuan { European from 1852-3 to 1855-6. / Native from 1848 }	—	—	—	—	—	—	—	—
Bengal Presidency { European for 1857-8. / Natives for 1848 to 50-1 and 1857-8. }	658	1,266	82	—	196·9	4·8	4·8	2·4
Sinde (for 1842)	—	—	—	—	—	—	—	—
General Hospital	—	—	8	—	—	—	—	—
Total	15,482	30,031	655	47	193·9	4·2	3·9	2·1

Divisions.	Natives. From 1842 to 1857-58. Average Annual Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.
Presidency	44,867½	29,891	826	349	66·6	1·8	1·06	2·7
Centre	60,530½	38,752	1,365	366	64·02	2·2	1·6	3·5
Southern	82,647½	61,447	1,710	983	77·9	2·06	0·8	2·6
Mysore	86,232½	63,835	1,554	787	79·2	1·8	0·8	2·2
Malabar and Canara	52,062½	31,536	511	61	60·5	0·9	0·8	1·6
Ceded Districts	59,253½	44,902	964	492	75·7	1·6	0·7	2·1
Hyderabad Subsidiary Force	122,483½	93,442	1,935	1,028	76·2	1·5	0·7	2·07
Nagpore Force	74,976½	48,139	1,027	322	64·2	1·3	0·7	2·1
Northern (European to 1851, and from 1857-8).	116,959	110,860	2,305	549	94·7	1·9	1·5	2·07
Southern Mahratta Division (European to 1846).	52,425	38,707	888	468	73·8	1·6	0·8	2·2
Saugor (from 1846)	60,728½	50,942	579	77	83·8	0·9	0·8	1·1
Tenasserim Provinces, Pegue (from 1852-3) Amalgamated in 1858-9.	62,981	90,249	1,495	154	143·2	2·3	2·1	1·6
Straits	22,665½	20,259	351	4	89·3	1·5	1·5	1·7
Aden (from 1844 to 1854-5)	14,062½	9,546	253	30	67·8	1·7	1·5	2·6
China { European, from 1842 to 1845 / Natives from 1842 to 1847 and 1857-8. }	11,685	26,673	1,024	15	228·2	8·7	8·6	3·8
Labuan { European from 1852-3 to 1855-6. / Native from 1848 }	1,338½	3,827	43	—	286·02	3·2	3·2	1·1
Bengal Presidency { European for 1857-8. / Natives for 1848 to 50-1 and 1857-8. }	7,668½	9,280	117	22	121·02	1·5	1·2	1·2
Sinde (for 1842)	162	18	3	—	14·2	2·3	2·3	16·6
General Hospital	—	—	215	5	—	—	—	—
Total	933,693½	779,775	17,165	5,717	83·5	1·8	1·2	2·2

Divisions.	Natives. For 1858-9. Average Annual Strength.	Treated.	Died.	Deaths from Cholera.	Per-centage of: Treated to Strength.	Deaths to Strength.	Deaths to Strength, excluding Cholera.	Deaths to Treated.
Presidency	2,247	2,270	17	4	101·02	0·7	0·5	0·7
Centre	3,291	3,958	106	31	120·2	3·2	2·2	2·6
Southern	5,825	4,966	126	87	85·2	2·1	0·6	2·5
Mysore	2,855	2,995	82	54	103·8	2·8	0·9	2·7
Malabar and Canara	2,956	2,379	57	21	80·4	1·9	1·2	2·3
Ceded Districts	4,013	3,285	23	6	81·8	0·5	0·4	0·7
Hyderabad Subsidiary Force	4,569	6,844	7	—	149·7	1·02	1·02	0·6
Nagpore Force	4,085	3,592	25	—	87·9	0·6	0·6	0·6
Northern (European to 1851, and from 1857-8).	9,938	8,581	116	—	86·3	1·1	1·1	1·3
Southern Mahratta Division (European to 1846).	243	153	4	—	62·9	1·6	1·6	2·6
Saugor (from 1846)	2,630	3,509	27	—	133·4	1·02	1·02	0·7
Tenasserim Provinces, Pegue (from 1852-3) Amalgamated in 1858-9.	10,440	14,962	248	18	143·3	2·3	2·2	1·6
Straits	1,843	2,029	53	2	110·09	2·8	2·7	2·6
Aden (from 1844 to 1854-5)	—	—	—	—	—	—	—	—
China { European, from 1842 to 1845 / Natives from 1842 to 1847 and 1857-8. }	195	808	18	—	414·3	9·2	9·2	2·2
Labuan { European from 1852-3 to 1855-6. / Native from 1848 }	146	807	5	1	5·5	3·4	2·7	0·6
Bengal Presidency { European for 1857-8. / Natives for 1848 to 50-1 and 1857-8. }	2,374	3,447	15	—	145·1	0·6	0·6	0·4
Sinde (for 1842)	—	—	—	—	—	—	—	—
General Hospital	—	—	38	3	—	—	—	—
Total	57,653	64,585	1,008	227	112·02	1·7	1·3	1·5

BOMBAY PRESIDENCY.

BOMBAY.

Accommodation:

Queen's Troops	Artillery	Head Quarters, 2nd Battalion	14	105
		4th Company, 1st Battalion	91	
	Infantry,—Head Quarters, 2nd European Regiment L.I.		588	
Native Troops	Artillery,—Gun Lascars		49	
	Infantry	2nd Grenadiers	769	1,757
		23rd Regiment Light Infantry	424	
		Marine Battalion	564	

References to Subjects and Queries.	Replies.
I. Topography.	1. Bombay is an island close to the west coast of India. It is partly hilly and in part flat, backed by mountainous land on the main. During the fair weather it is dry, but it is swampy in the low lands during the rains. About half the island is covered with woods, and there is but very little waste ground. Many tanks exist, but no springs are to be found there. Mountainous islands stud the harbour, between which and the western ghauts of India is an intervening strip of low land, called the Konkan, varying from 10 to 30 miles in breadth. 2. The elevation of the station above the sea is about 180 feet at the highest point, much is but a little above the sea at high water. There is some high land adjoining the station, but it is mountainous, without table land or plateau, and of no advantage in a military point of view. 3. The nearest mountain table land is Matheran, about 50 miles distant, and about 2,800 feet above the level of the sea, but it is only four or five miles long, and less in breadth. 4. The station is surrounded by the sea, but there is no lake or river in the vicinity of any consequence. There are estuaries of the sea running into the mainland, which are more or less bordered by marshes. There are also salt water marshes in the adjoining island of Salsette, within a mile or two of Bombay. The vicinity of the station is subject to overflow, and, besides the tides which daily overflow, there are the rains which last from June to September, inclusive, and for the most part during that time deluge the island. The marshes in Salsette are supposed to be a cause of fever in Bombay, from the wind blowing over them to that place in October, but not to any remarkable extent. 5. The station is open and exposed to the winds. The barracks for the Artillery (*i.e.*, Fort George), however, are hemmed in by the fort walls, and confined, and the barracks for the line are in the midst of high buildings in the fort of Bombay. Those at Colaba are freely open to the air. The native lines are not well situated in this respect. The temperature of the station is, in Fort George, where the Artillery are situated, and also in the barracks for the line in the fort of Bombay, much raised by the buildings being exposed to reflected sun heat. With respect to Fort George, this evil has been much mitigated, if not altogether removed, by having the lime-wash of the exterior of the buildings coloured a dark grey. Fort George I consider a tolerably healthy situation. The winds to which the station is exposed are pretty regular, blowing from the sea by day and the land by night in the fair weather. The land winds are the cause of severe rheumatism, fever, &c., to persons exposing themselves to them while asleep. During the rains the wind blows chiefly from the south-west, and are, like the sea breeze of the fair weather, healthy, but damp. 6. The island is for the most part cultivated, so is also the mainland between the mountains. There are tanks for irrigation, besides which there is a large reservoir in the island of Salsette, about 12 miles from the town of Bombay, which supplies it plentifully with water; it is situated in the valley of Vehar, in Salsette. No ill effect on the health of the station has been observed to arise from artificial irrigation. There are no limits placed to the cultivation of rice. Wherever the land suits it is planted, but not nearer than three miles from the fort. Neither indigo, hemp, nor flax are grown in the island. 7. The station is close to the town of Bombay, the population of which is said to be between 400,000 and 600,000 persons. 8. The whole district in its geological formation consists of trap and trap rock, with shell beaches on the shores towards the sea. The ground of the station has been built over for centuries, and the barracks and lines are on part of it. 9. Water is found during the dry season at from 13 to 18 feet below the surface, and during the wet season from 0 to 10 feet. 10. The rainfall and surface water flows steadily away from the hills, but not from the neighbouring plains. It chiefly runs off the surface, the soil being hardly more than 18 feet thick anywhere, and almost all argillaceous; where there are depressions it remains until it evaporates or is removed for purposes of irrigation. There is no drainage from the adjacent higher ground passing into the subsoil of the station. 11. The water supply of the station is derived mostly from wells, but at Colaba, where the well water is scanty and brackish, there are two covered tanks within the lines. The Vehar lake water will shortly be available for ample supply at Colaba. There are tanks all over the island of Bombay more or less, of various sizes, but none in the fort. There is, however, the fort ditch instead. The same also at Fort George, which has also a tank. There is no tank at Colaba, where the other barracks are. The tanks are filled by the rains and gradually become exhausted towards the end of the dry season. These tanks contain here and there water plants, shell fish, and a few little fishes, but for the most part they are kept free from all. The tanks used for bathing purposes in the fort are not used for drinking, but the water from most of them, when taken home, is used for domestic purposes. They are kept as clean as possible, and the first fall of rain is not allowed to enter those most used. No ill effect on health is apparently produced by the tanks of Bombay. 12. The water supply is generally ample, except at Colaba, as before stated, but the quality of the water in the wells varies greatly. It contains for the most part a large quantity of lime and brackish sea salt in addition. That which is drinkable, although not of the best kind, is not unwholesome. The water from the reservoir is almost pure. The means of raising the water is by ropes and buckets, and by Persian wheels at the tanks and wells, whence it is conveyed to the troops by water-carts, puckallies, and bheesties. The whole of the barracks, &c. should be brought into connexion with the Vehar lake main, and all existing tanks kept full by the same to meet possible occasional failure in the main pipe.

BOMBAY.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	13. There is nothing remarkable either in favour or against the climate of Bombay. It is for the most part very relaxing, but suits many Europeans much better than the dry atmosphere of the interior of the continent—children and persons rather advanced in life, and old residents in India. 14. New stations are generally selected by a committee of military medical officers.
II. CLIMATE.	1. There is an observatory at Bombay for conducting and registering meteorological observations. 2. Table of Meteorological Observations.

TWO YEARS of OBSERVATION, from JANUARY 1858 to DECEMBER 1859.

Months.	Barometer, Mean.*	Mean Temperature.	Mean Daily Range.	Rain, inches.	Winds. Sea. Hours.	Winds. Land. Hours.	Days of Sunshine.
		°	°				
January	29·927	74·0	14·2	—	17⅛	7	—
February	29·928	75·9	13·5	—	19½	4¼	—
March	29·865	79·6	12·5	—	19½	4¼	—
April	29·792	84·4	12·0	0·10	20	4	—
May	29·731	85·7	10·4	0·80	21⅓	2⅓	—
June	29·682	84·3	8·9	20·66	20½	3¼	—
July	29·648	81·8	7·8	23·98	20	4	—
August	29·725	80·4	6·9	11·03	23½	½	—
September	29·778	80·1	8·3	10·71	18	5⅓	—
October	29·888	80·7	10·8	2·11	15	8½	—
November	29·889	81·7	13·1	—	12½	11	—
December	29·937	74·8	13·5	0·7	10½	7	—

* Barometer 37½ feet above the mean sea level, and reduced to 32° Fahrenheit.

REMARKS as to CLOUD, DEW, WIND, STORMS, &c.

Winds.—From the beginning of June to the beginning of October the south-west monsoon prevails, and after a short interval of close muggy weather, is succeeded by north-easterly winds, which inconstantly alternate with north-westerly (sea) breezes through the cold season, and on from the beginning of March towards the monsoon, a period which embraces the hot weather. The land winds (north-easterly) are the most injurious to the inhabitants.

Tides.—The rise of the tide is usually 14 feet, and occasionally as high as 17 feet. Bombay is said by McCulloch to be the only port of consequence in India where the rise is sufficient to afford wet and dry docks. The harbour of Bombay is deep and capacious, with a safe though narrow channel, entered from the southward.

Rain.—The annual average fall of rain, which is almost entirely confined to the monsoon, may be put down at 78 inches, and the number of rainy days at 102. The evaporation of Bombay is excessive, and almost equals, it is said, the average fall of rain.

Barometer.—The average range during the whole year is very slight, 0·110 inch or 0·112 inch representing it. Occasionally in the cold months the daily variation is as much as 0·2 inch, and during the monsoon as little as 0·120.

3. The climate of Bombay, from its proximity to the sea, is generally more or less moist, in the rainy seasons particularly so, and with the exception of about three months in the year, viz., December, January, and February, is very debilitating. The streets are watered during the dry season, and the air is tolerably free from dust. The slaughter-houses and public necessaries situated at Boree Bunder, when the wind is from the eastward, affect the purity of the air in places situated close by. The number of sick among the troops in Bombay is usually above the general average. Drill and exercises take place generally in the cold weather. The native troops, from the dearness of provisions, cannot afford to feed themselves and families sufficiently well. The most healthy months are from January to June, the remainder being generally unhealthy; the prevailing diseases during the latter months being fevers and bowel complaints.

4. Malabar Point might with some expense be made a capital sanitarium for European troops, capable of accommodating from 250 to 300 men. Water is scarce, and must be supplied from the Vehar waterworks.

5. I have served at a great many stations, and may say generally that while the table land is good for healthy men, and the hills for those who are simply debilitated from intermittent fever, &c., yet the lower and coast stations are the best for children and old residents in India.

III. SANITARY CONDITION OF STATION.

1, 2, 3. Plans and sections are transmitted of Town barracks, Fort George barracks, *Colaba* barracks, and the depôt barracks.

4. TABLE of Barrack Accommodation.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
*Town Barrack.**	106	Ft. In.	Ft. In.	Ft. In.				Ft. In.		Ft.	Ft.
Ground Floor	106	356 0	32 0	132 0	149,994	1,415	107	1 8	24	5	3
Do. do.		356 0	32 0	132 0	149,994	1,415	107	1 8	24	5	3
Upper Story centre room	106	302 0	44 4	11 6	153,962	1,452	126	1 8	24	9	4
Do. side room	71	211 6	44 4	11 6	107,824	1,518	132	1 8	15	9	4
Do. do.	71	211 6	44 4	11 6	107,824	1,518	132	1 8	15	9	4
Total	460	—	—	—	—	—	—	—	102	—	—

* Date of construction of barracks about 1804; total number of rooms or huts, 5 rooms; total regulation number of non-commissioned officers and men, 460.

4. Table of Barrack Accommodation—*cont.*

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		Ft. In.	Ft. In.	Ft. In.				Ft. In.		Ft.	Ft.
Guard Room	7	44 0	20 0	11 0	98	1,383	125	1 8	4	6	3
Prisoners' Room in do., 6, each	1	8 0	7 0	11 0	616	616	56	1 8	1	2	3
Solitary Cells, 6, each	1	10 0	10 0	12 0	1,200	1,200	100	1 8	3	2	3
*Fort George Barrack.**											
Lower Story room, 3, each	44	143 6	23 8	11 8	39,621	900	77	1 8	12	8	4
Upper do. do.	44	144 6	24 5	14 4	50,513	1,148	80	1 8	12	5½	4½
* Total	264	—	—	—	—	—	—	—	72	—	—
Quarter Guard room	7	49 0	14 0	12 0	8,232	1,176	98	1 8	11	4	3
Advanced do.	7	44 6	11 6	12 0	6,141	877	73	1 8	3	7½	4
									6	4½	4
Do. do. cells, 2, each	1	10 0	11 6	12 0	1,380	1,380	115	1 8	1	2	2½
Prisoners' room	4	23 0	14 0	12 0	3,864	966	80	1 8	5	5	3
Do.	3	18 0	14 0	12 0	3,024	1,008	84	1 8	3	5	3
Solitary cells, 4, each	1	10 0	10 0	16 0	1,600	1,600	100	1 8	3	2	3
Colaba Barrack.†											
Single men's rooms, 6, each	53	211 0	22 6	12 0	56,970	1,075	89	1 8	20	6	3
Total	318	—	—	—	—	—	—	—	120	—	—
Quarter guard room	4	20 0	20 0	11 3	4,500	1,125	100	1 8	3	3	2⅓
Do. do.	4	20 0	20 0	11 3	4,500	1,125	100	1 8	3	3	2⅓
Do. prisoners' do.	1	10 0	9 3	11 3	1,040	1,040	92½	1 8	1	2½	2
Do. do.	1	10 0	9 3	11 3	1,040	1,040	92½	1 8	1	2½	2
Advanced guard do.	7	50 0	20 0	7 6	7,500	1,071	142	1 8	6	2½	2
Hospital do.	4	21 0	14 0	9 0	2,646	661	73	1 8	2	6½	4
									3	3½	2½
Solitary cells, 6, each	1	100	10 0	11 6	1,150	1,150	100	1 8	3	2	3
Depôt Barrack.‡											
4 small rooms	31	32 6	16 0	16 6	38,110½	1,200	65	1 8	7	5	3
2 do.		24 6	16 0	16 6					6	7	3½
1 large do.		45 0	25 0	20 6					—	—	—
Total	31	—	—	—	—	—	—	—	13	—	—
Guard room	7	21 9	20 0	8 9	3,806	543	62	1 8	2	4	3
Do. prisoners' room	6	22 0	20 0	8 9	3,850	641	73	1 8	3	4	3
Do. to hospital	4	17 9	13 6	12 0	2,875	718	59	1 8	3	4½	3
									2	2	3
Solitary cells	1	10 0	10 0	11 6	1,150	1,150	100	1 8	3	2	3
Do.	1	10 0	10 0	11 6	1,150	1,150	100	1 8	3	2	3
Do.	1	10 0	10 0	11 6	1,150	1,150	100	1 8	3	2	3

* Date of construction of barrack unknown; total number of rooms or huts, 6 rooms; total regulation number of non-commissioned officers and men, 264.

† Date of construction of barrack, 1816–26, 1843–45; total number of rooms or huts, 6 rooms; total regulation number of non-commissioned officers and men, 318.

‡ Date of construction of barrack, unknown; total number of rooms or huts, 7 rooms; total regulation number of non-commissioned officers and men, 31.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. In the town barracks ground floor, on the inner side, are arched doorways, and on the opposite outer walls windows with iron bars and plank outer shutters. On the upper floor there is a similar apportionment of doorways and windows, the latter in the outer wall having Venetian shutters opening outwards. In the Fort George barracks there are no windows, but door or window openings on opposite sides, with upper similar opposite ventilating openings. In the Colaba barracks the windows are on opposite sides and open inwards. On the western side they have glazed shutters, but on the eastern, plank only. In the depôt barracks at Colaba the windows are on opposite sides, having wooden bars and plank shutters, opening outwards. In the town barracks there is a verandah on one side only of the rooms, from $10\frac{5}{12}$ to $11\frac{3}{4}$ ft. in width, running round the quadrangle on the three sides occupied by the barracks. In Fort George barracks verandahs $11\frac{5}{12}$ ft. in width extend the whole length of the building on both sides of the barrack rooms. In the Colaba barracks verandahs 9 feet in width extend the whole length of each barrack on both sides of the rooms. The depôt barracks have no verandahs. The verandahs are never used as sleeping quarters by soldiers, or other persons, unless when there has been an unusually large number of sick. There are no jalousies or jhilmils in any of the barracks, but in the town, Fort George, and Colaba barracks the verandahs have plank shutters, which can be raised or let down as desired. The depôt barracks have fixed mat weather frames over the doors and windows.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	6. The bedsteads used in barracks are iron cots, the bedding consisting of calico cases stuffed with straw, renewed frequently. No improvements are suggested. 7. No reply to this query. 8. In the town barracks iron cowls are fixed at intervals on the ridges for ventilating purposes. In Fort George barracks the ventilating cowls are of wood. In the barrack rooms also oval ventilating openings at intervals, high up in the walls, communicate with the verandahs. In the Colaba barracks there are lofty continuous ventilators with glazed shutters. In the depôt barracks the cowl ventilators somewhat resemble dormer windows. The means of ventilation are generally found sufficient, at least there are no complaints. The Fort George and town barracks should be provided with continuous ventilators along the ridges, if likely to be crowded with troops. The air of the barrack rooms is cooled by punkahs, those in Fort George are arranged on the most economical plan, so that six punkahs can be pulled easily by one man. 9. Barracks are constructed of stone and lime masonry with lime plaster, the roofs being teak trussed with double tiles. 10. In the town barracks the ground floor is laid with cut stone flags, about 1 foot above the ground, and no passage for air beneath. The upper floor is cut stone flags in rooms, and teak planking in the verandahs. In Fort George barracks the ground floor is laid with cut stone flags, about 4 feet above the ground, with no passage for air beneath, and the upper floor is composed of teak planking throughout. In Colaba there are three barracks with mud floors in the rooms, and cut stone slabs in the verandahs, and the other three are of cut stone slabs throughout. The whole is raised about 1½ feet above the ground level. There is no passage for air beneath. In the depôt barracks the floors are composed of mud raised about 1½ feet above the ground level, and having no passage for air beneath. 11. The materials used in the construction of barracks, huts, and tents are generally suitable for the climate, but at Colaba it is desirable (as lately decided by a committee) that all the barrack room floors should be raised at least 14 feet above the ground, the ground floor below to be used only in the daytime for dining and other purposes. The barracks and cantonments are kept in repair by the garrison engineer, and repairs are executed as circumstances will admit of. The walls and ceilings of barracks are cleansed and lime-washed about once in six months, but this is quite dependent on the barrack master, who might call for its execution if he pleased at shorter intervals. 12. In the town barracks the men's lavatory is 50 ft. by 20 by 10, with double bamboo mat walls and partitions, tiled roof, and cut stone floor. The water is supplied by bheesties, and it is drained by a channel cut in the floor all round the wall, which leads into the urinaries, and thence into the main drain. At Fort George barracks the lavatories are made in the rear and front verandahs with plank partitions, and pore bunder stone floors; the water is brought up by bheesties and put into barrels. The drainage runs into pipes and troughs, and so into the ditch. In the Colaba barracks there are six wash-houses, one for each barrack room, each measuring 53 by 12 feet, in which are placed water barrels for bathing purposes, supplied by bheesties. In the depôt barracks there is one room 22½ by 13 by 10 ft. which is divided in two by a mat partition, one of the rooms is used for bathing purposes, and the other is converted into a urinary. The bathing water is supplied by bheesties. Masonry drains are constructed to carry the waste water into the sea. 13. In the town barracks the cook-house is 45 by 20 by 9½ ft., and contains 27 fire-places, of brick and lime, with irons on a masonry platform 3 feet high and 3 feet wide; the roof is tiled and has an opening for the smoke to escape. The water is brought in by bheesties and put into water casks, the refuse water being conveyed away in a drain to the sea. At Fort George barracks the cook-house is 63 by 21 by 10 ft., and similar to that of the town barracks, and the water is supplied in the same way. The waste water is conveyed into the ditch behind the barracks. In the Colaba barracks there are four cook-houses to the barracks, each 28 ft. by 20 ft. by 7 ft., and the water is supplied by the regimental bheesties. The refuse water is at present thrown on the ground, where it evaporates or sinks in the soil. We are of opinion that cesspools for the refuse water and slops at each cook-house would be an improvement, and if made 3 ft. square and 3 ft. in depth would not be expensive, and could be easily emptied. In the depôt barracks the cook rooms are 34 by 12 by 10 feet and 15 by 12 by 10 feet, and the rest is similar to the above arrangement, excepting with regard to the refuse water, which is received into cesspools. There are regular washing places built on the esplanade for washing linen, with ground for drying, and also on the Byculla flats, three miles from thence. Many washermen take their clothes to wash several miles from Bombay. As far as the station is concerned I consider the washing places on the esplanade are sufficient. 14. In the town barracks the privy consists of plank seats, under which are drains, which can be flushed with water, the soil being thereby conveyed to the sea. Half the height of the walls is of masonry and the other half is composed of wooden railings. The roof is double tiled, there are two urinals attached to the lavatory, which are flushed by the water therefrom. In Fort George barracks the privy is nearly similar to the above in construction and arrangement, except that the railing and urinals are under separate roofs. In the Colaba barracks the privies are constructed on the sea beach, and the sullage therefrom is carried away by the tide, and in the depôt barracks the arrangements are the same as above. 15. The privies and urinals have tiled openings in the roof, which with doors and windows afford sufficient ventilation. The barracks are lighted at night by oil lamps suspended from the roof. 16. In the town barracks the rain water is conveyed away through a masonry drain to the sea, as also is the soil from the privy and urine from the urinals. The length of the whole is 811 feet and the breadth and depth from 1½ to 5 feet, and 1½ to 12 feet respectively, the distance of outlet from the barracks being about 250 feet. There are no cesspits for the reception of the waste water. In the Fort George barracks there are drains to convey the rain water into the ditch 72 ft. by 1½ ft. by 1½ ft., but no drains from the privies, which run into an open ditch washed by the sea, over which they are built. This ditch is always in a foul state, the cleansing by the tide not being sufficient, and there are no cesspits for the reception of the waste water. In the Colaba barracks the arrangements for draining and sewering appear upon the whole to be pretty good. A main drain runs the whole length of the barracks between the two ranges; this drain is covered and 2 feet square with a flat bottom, and at every 50 feet there is a trapdoor to admit of its being cleansed; the drain has also the advantage that the slab stone covering can be easily removed and replaced. I

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	empties itself on the sea beach at about 100 feet from the nearest barrack; into this main the urinals and washhouses all empty themselves of their refuse water, and there are two covered drains of an exactly similar description for the two rear barracks, but only 1 foot square; they empty themselves on the beach, and besides these there are open drains in all directions round the barracks, sufficient to carry off the rain water in the monsoon to the sea beach. There are two masonry covered drains, 1 foot square, one for each barrack, to carry all waste and rain water to the sea beach, about 125 feet from the barracks. The main drain in these barracks requires regular flushing to keep it clean, as for a greater part of its length the fall is slight. There is a small cesspool attached to these barracks for the use of the regimental quarter guard, about 200 feet distant from the nearest well or tank, 80 feet from the barrack room, and 300 feet from the hospital, and was emptied in March last by the engineer department; and in the depôt barracks the drainage is quite sufficient for all the purposes required; the drain from the washhouse empties itself into the drain for married men's barracks, and the waste water of the cook room is received into the cesspool, which is close to it, the dimensions of which are 4 ft. by 4 ft. by 5 ft., but at least 100 ft. distant from the nearest well, and 45 ft. from the nearest barrack; it is cleaned out periodically by the barrack department by having its contents carried away in tubs to the sea-shore. The drainage appears amply sufficient for conveying away both the surface water and the sewerage in all the barracks. All the barracks and hospitals must be more or less damp during the rainy season. All the fluid refuse is carried off into the sea. The main drain is a great nuisance, but it is situated at some distance from the lines. At Byculla the stench at times is scarcely to be endured. 17. The surface cleansing is efficiently done by sweepers, the rubbish being carted away and thrown into the sea, or distributed elsewhere out of the men's way. 18. The cantonment is generally free from vegetation, and there are no old walls, thick hedges, &c. interfering with the ventilation of the station, bazaar, &c. 19. The native town close to the esplanade is very defective in drainage, &c., but water can now be supplied to the bazaar from the Vehar waterworks. There is a municipal commission for regulating and preserving due cleanliness in the bazaar composed at present of the deputy commissioner of police, an officer of the Bombay engineers, and an European inhabitant; the engineer is appointed by Government, and the other two are elected by the bench of magistrates of whom the natives preponderate. The native houses generally are in a filthy condition, and until the municipal commissioners, who are believed to be energetic in remedying this, can effect the object, much ordure will remain within the precincts of the buildings, where it has been accumulating for years; this reply may be taken for all the other questions on the subject. Nuisance is experienced in the town barracks by the wind blowing over the densely-packed houses, also in the Fort George from the butchers' shambles and public necessaries about half a mile to the south, and the latter of which there is no means of remedying, but the town barracks are, it is believed, about to be given up for civil office purposes. 20. The slaughter-house is situated as above mentioned. The disadvantages of the lines of the native regiments, all of which are in this locality, may be here stated. The site is as bad as it can well be; close upon the northern extremity is a densely populated native town, proverbially unhealthy, close at the eastern face is a large fish and meat market, and separated from this by little more than the breadth of the railway, are the butchers' shambles and public necessaries above mentioned. On the south close by are large railway buildings, and what is particularly obnoxious is the washermen's tanks, where enormous quantities of clothing are washed, and where many of the washermen remain day and night. That which might be expected to be the best aspect, the one looking towards Back bay and the open ocean, has most of the sea breeze shut out from it by the bazaars, and there used to be formerly newly dyed cloths spread to dry in the direction, but this nuisance was some years ago, on representations being made, immediately put a stop to. The fact is that the island of Bombay is such a populous and commercial place that Government, it is believed, scarcely know where to turn for an open space of ground. 21, 22. No reply to these queries. 23. In the town barracks there are no separate married men's quarters; the lower story is generally used by the married non-commissioned officers and men. In Fort George barracks there are sufficient quarters in the front and rear verandah-rooms of the lower story for married non-commissioned officers and men. In Colaba barracks and in the depôt barracks sufficient married quarters are provided, and no married people are allowed to occupy any of the barrack rooms with the single men.
Officers' Quarters.	1. The officers' quarters in the town and Fort George barracks are in tolerably good sanitary condition, those of the Colaba and depôt barracks are in excellent sanitary condition; the drainage is effected by covered and open drains communicating with the sea either direct or by the street drains. Ventilation is effected by the doors and windows and no improvements suggest themselves at present.
IV. Health of the Troops.	1. The stations themselves are healthy, but the adjoining native population is crowded, owing to the houses being so close to each other without drainage or free air, and the excess in the number of inmates. 2. The diseases most prevalent are small-pox and measles at times, and cholera at others epidemically; the latter is often present in a sporadic form. 3. The circumstances to which unhealthiness of natives is attributable are filth and almost entire want of free circulation of air. 4. The 4th company 1st battalion of Artillery from Sinde arrived at Kurrachee, 29th December 1853, remained there till the end of 1856, when the company was ordered to Persia, where it was employed from 7th December 1856 till the 27th September 1857. It then returned to Kurrachee and proceeded to Hyderabad, arrived there 27th October 1857, left it again for its present station, Bombay, 23rd October 1858. In Sinde the men appear to have been pretty healthy, the average number of sick being about four or five per month; the prevailing sickness was intermittent fever. On arrival in Bombay (which they reached on the 9th November 1858) many of the men were impaired in health, besides a liability to return of ague, they have suffered very much whilst in Bombay from dysentery. The 2nd Grenadier regiment N.I. was stationed at Ahmedabad before coming to Bombay, was quartered there for 3 years and 2½ months, having left it on the 10th March 1859; the state of health of the

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	regiment at Ahmedabad was good, the diseases from which the men chiefly suffered have been fever and rheumatism. The state of health of the regiment on its arrival at Bombay was good; it arrived on the 21st March 1859, at its present station. Since its arrival at Bombay the men of the 2nd Grenadier regiment have suffered chiefly from fever, scurvy, and rheumatism. The 23rd regiment N.L.I. arrived at Bombay from Mhow, the head quarters, was stationed there 15 months, and left it on the 28th March 1860; the admissions into hospital at Mhow were 1050, chiefly from fever. The regiment reached Bombay on the 1st May 1860, since when in one year after date of arrival the sick increased to 1242, the diseases being scurvy and fever; during the above period of the regiment's stay in Bombay 300 men at one time, though doing duty in the lines, were daily attending hospital for medical treatment. Her Majesty's 2nd European regiment L.I. was at Belgaum before coming to Bombay, and has left during the preparation of this report for Neemuch. Better accommodation and ventilation are required for the troops at Colaba, and new barracks are necessary. 5. The troops at this station are not camped out. 6. Hill stations do well for healthy men and for those who are simply debilitated from fevers, &c., but they are injurious in many cases in convalescence from dysentery and structural changes of the liver, &c. 7. I have not observed that troops who have been resident for some time in hill stations are more or less liable to attacks of febrile and other diseases on returning to the plains. 8. Hill stations are beneficial to the men at certain seasons, but not throughout the year. 9. At hill stations the peculiar diseases to which the men are subjected are perhaps head affections and rheumatism, though the latter cannot be said to be peculiar; and there are what are called hill diarrhœa and dysentery; elevations above 4,000 feet are not suited to chest affections. 10. More clothing, and especially increase of protection from the sun, would be beneficial at hill stations. 11. The season best adapted for residence at hill stations is the hot season. The shortest period of residence which would enable troops to obtain the full benefit of such residence would be from the middle of March to the commencement of the rains in June, about 2½ or 3 months. 12. I am not aware that there is any period of residence beyond which injury is likely to be inflicted on the health of the troops, on returning to service in the plains, but the rains (monsoon) do not admit of hill stations, generally speaking, being resided at the whole year through. 13. I am not aware of any precautions required for protecting the health of the troops on leaving hill stations for the plains, except to allow them to return at a proper season of the year. 14. Without speaking positively, I should say that service in the plains with shorter periods of change to hill stations might be expected to be the most advantageous to the health of the troops. I consider a change of station every second or third year to be beneficial. 15. Our hill sanitaria are most at present in their infancy, but great attention is being paid to procure healthy and comfortable accommodation. 16. I have no personal experience to show at what ranges of elevation above the level of the sea the most suitable sites for hill stations may be obtained. 17. There is Malabar Point, which could be advantageously occupied as a hill station, the extremity of a range of trap rock of that name jutting out into the ocean, at present one of the seats of government. This point could be easily made to accommodate about 300 men, and would be very suitable for a sanitarium; it is upwards of 100 feet high, and has a capital road to it about 5 miles long; there is a scarcity of water, but that could be supplied by the Vehar waterworks. 18. I have never found any particular classes of surface and subsoils for stations more healthy or unhealthy than others. 19. From 18 to 20 years is the best age for soldiers to proceed to India, and they should arrive there at the beginning or end of the year. Those arriving in the cold season are generally sent at once up the country to join their corps or departments, and to preserve the health of recruits on first landing they should be sent up the country as soon as possible. 20. An intermediate station should, I think, be preferred to send the troops to previously to their going to India, and on their arrival in India they should be sent to hill stations where practicable. I may add that June and July are the best months for leaving England, viâ the Cape, for ensuring not only the best passages, but also the best time for marching into the interior on arrival in India. 21. The mode of transport of troops from the port to the interior is by steamers or sailing vessels and sometimes by country boats. 22. The number of years a British soldier should serve in India is about 7 years. 23. The manner of conducting the business of medical boards at stations or presidencies is not such as to cause conflict of opinion as regards invaliding, but the services are in a state of transition; at present there is one mode of invaliding for the local army and another for the British. 24. Invalids should leave India for home in the month of February.
Diseases.	1. There are regular inspection parades for the discovery of incipient diseases at this station. 2. No cases of scorbutus or scorbutic disease have occurred among the troops at this station, except amongst the native soldiers, who feed themselves badly in consequence of the high price of provisions. In Bombay the duty is more severe than in most stations, and the price of provisions more expensive; extra batta might be allowed, and a native regiment should be relieved after the expiration of two years service in Bombay. 3. When hepatic disease owes its origin elsewhere than Bombay, that station is a very suitable place to send such cases to. 4. The appearance of dracunculus seems attributable to the water of certain notorious places, but whether it occurs from the men drinking or bathing therein is not determined. 5. The proportion of sick from venereal diseases to the total sick in hospital varies much, but the proportion in Bombay, as is to be expected, is great. Lock hospitals have been generally abolished at this presidency.

References to Subjects and Queries.	Replies.
IV. Health of the Troops—*Diseases—cont.*	6. The average strength of the European troops in the Bombay garrison for the past year amounted to 423 in number, of which 277 cases of fever have been admitted into hospital, chiefly of intermittens and quotidiana; of these 31 were of remittent fever, of which 6 died, and from continued fever there were 7 admissions and 1 death; total 7. Of dysentery there were 33 cases, and 1 death. Of epidemic cholera there was one admission, and which terminated fatally. Of small-pox 1 case was admitted, but no death, and of rheumatism there were 34 cases, but no mortality. The average strength of the native troops of the garrison amounted 2,105 in number for the past year, and the admissions into hospital from fever (chiefly quotidian) amounted to 1,330, of which number 7 died. Of dysentery there were 26 admissions and 2 deaths. Of cholera and cholera morbus, there were 11 admissions, and one death. Of small-pox there were 7 admissions, but no death, and of rheumatism there were 172 admissions, but no death.
	7. The nosological character of the more frequent zymotic diseases were:—
	Fevers { Febris ephemera. / „ intermittens tertiana. / „ „ quotidiana. / „ remittens.
	Eruptive Fevers { Variola. / Rubeola.
	Cholera, epidemic.
	Fevers prevail most in the months of August, September, and October. Eruptive fevers prevail in the months of April and May; and cholera in the months of March, April, May, and June. No particular condition of the atmosphere was observed either to precede or accompany their appearance. The sanitary condition of the regimental lines at Colaba is very indifferent; the barracks are built in a low situation, and consequently are very damp in the rainy seasons; the buildings themselves are well ventilated, the necessaries and urinals are situated to windward of the barracks, and the drains empty their contents on the beach, also to windward of the buildings; consequently the wind, which generally prevails from the west, carries the odour through the barrack rooms, which must prove hurtful to the men. The water supply is both plentiful and of good quality. The native dwellings in the neighbouring bazaar are crowded, badly ventilated, and the habits of the natives themselves are filthy in the extreme, and in my opinion predisposes them to the above diseases. As to the situation of the lines of the native soldiers, I believe it is as bad as it well can be; close upon their northern length lies a densely populated native district proverbially unhealthy; close on the eastern face is a large fish and meat market, and separated from this by little more than the breadth of the railway are butchers' shambles and public necessaries or privies washed by the sea, but extending along the whole of its margin in this direction; on the south are large railway buildings and the dhobies' tanks, where great quantities of clothing are washed, and where many of the washermen remain day and night. That which might be expected to be the best aspect of the lines, the west, looking towards Back bay, has much of the sea breeze shut out from it by the regimental bazaar, and the golundaze and gun lascars lines.
	8. Exposure to the sun and night dews when the soldier is in the field or on the march is likely to cause his general health to suffer and predispose him to epidemic disease.
	9. At this station quinine has not been tried as a prophylactic against malarial diseases, and I know of no instance in which healthy men have been put on a course of quinine with this view; as an antiperiodic quinine is found most successful in large doses.
	10. The great desideratum is to keep the regimental lines and bazaars thoroughly clean by a complete system of drainage, a liberal use of charcoal and quick lime to the urinals and necessaries, and to have the drains well flushed, and lastly, to prevent the men being exposed to the mid-day sun as much as possible (and to remove the present barracks to the higher ground on the opposite side of the road), also to have sheds and suitable workshops erected to enable the soldiers to carry on their different trades, and have their amusements without requiring them to go out in the sun.
V. Intemperance.	1. The soldiers at this station are generally temperate, only about one per cent. of confirmed drunkards.
	2. The proportion of admissions into hospital through intemperance are 3·7 per cent. I have no return from which I can prepare a statistical table, showing the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station. Drunkenness is punishable as an offence.
	3. Distilled spirits are sold both at the canteen and in the bazaar, and each man is only allowed one dram per diem of the best quality, which forms part of the ration at the station, on the march, and in the field; arrack of the best quality is alone used, and no spirits are allowed to be issued from the canteen before 12 at noon. In the field they are allowed 2 drams, but I consider it prejudicial to health, particularly to young soldiers. Spirit is never given as a ration to convalescents. No other than intoxicating drinks are sold at the canteen or bazaar which are injurious to health.
	4. I consider the daily consumption of spirits by the troops injurious to health, and certainly not conducive to the efficiency and internal discipline of the corps.
	5. It would in my opinion be highly beneficial to the health of the troops to abolish the use of spirituous liquors as part of the ration, and to prevent the sale of them in the canteen and bazaar.
	6. Good malt liquor would in my opinion be more beneficial to health than spirituous liquors.
	7. Coffee is very much used as a drink at this station, I consider if the soldiers were to drink only tea, coffee, and lemonade, they would in all probability enjoy better health, while the efficiency and discipline would be in a better state than if they drank spirituous liquors; malt liquor, however, in moderation I do not think would be in any way injurious.
	8. It would be highly beneficial as a general rule to suppress altogether the spirit ration, whether for soldiers or convalescents, and to substitute for it, beer, tea, or coffee, &c.

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	9. I believe it would be beneficial to the men to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, coffee, tea, lemonade, &c., to be sold to the troops; but in Bombay, where there are so many facilities and inducements to buy drugged liquor of the most deleterious kind, every possible means should be taken to prevent the necessity of a man's going outside to seek his dram. There is a penalty for selling liquor to a soldier, but the law is easily evaded so as to be almost inoperative.
	10. I would recommend that each man who may desire it be allowed two quarts of beer or porter per diem, and to be served to him half at dinner and half at night before going to bed.
	11. By the canteen regulations the issue of malt liquor is made at the rate of one quart of porter to each man, besides which they are allowed a dram of arrack per diem. The canteen is opened from 12 noon to ½ to 1 p.m., from 2 p.m. to ½ to 3 p.m., and from sunset to a quarter before tattoo. No man is allowed to have 2 pints of porter at one issue.
VI. DIET.	1, 2. For the Queen's British troops, a complete ration, including a due proportion of vegetables; no fruit is provided for troops at the station, and no stoppage on account of ration. The soldier has three meals a day: 1st, breakfast at half-past 9 a.m., consisting of tea, milk, bread, fish, eggs or meat, whichever he chooses to purchase; 2nd, dinner at 1 p.m., consisting of beef, rice, bread, and vegetables, such as potatoes, onions, carrots, &c.; 3rd, supper at half-past 4 p.m., this meal consisting of very little coffee chiefly, and what the soldier provides at his own expense, or what he saves from his dinner. (2.) For European troops in the Indian army, the ration is, 1 lb. of meat, 1 lb. of bread, 1 lb. of vegetables, 4 oz. of rice, 2½ oz. of sugar, ½⅛ oz. of tea, 1 oz. of salt., and 3 lbs. of firewood. The rations are inspected by orderly non-commissioned officers, and passed by the orderly officer, and when objected to, by a committee of two military and one medical officer.
	3. I believe it would be an improvement and conducive to the health of the troops to vary the meat, and to allow them to have mutton alternately with beef, or say two days in the week. Good mutton in quantities is difficult to be procured in Bombay. It would also be an improvement and conducive to health to increase the vegetables to 1½ lb. The existing arrangements prevent the men from disposing of any of the rations. Orderly men also are appointed daily to look after the messing, and they are responsible for the rations in every way from the time they receive them from the quartermaster's stores.
	4. The means and apparatus available for cooking at the station are copper pots tinned once a month. The cook-rooms attached to the barracks are small and close, and are badly constructed, and instead of the smoke finding a free and easy exit, it disseminates itself throughout the room, and then not only half-blinds the cooks, but renders every attempt at supervision utterly abortive. The supply of water is abundant. The food is generally boiled. The cooking is properly done, and the different messes generally manage to have a variety of dishes, such as curries, stews, &c. Tea and coffee are also properly prepared. The men always have the latter articles supplied to them about half way between halting places on the march.
	5. I do not believe that gardens could be advantageously established near the station for the cultivation of vegetables by soldiers, no ground being available for such a purpose. Where grounds and water are available, gardens should be established, and men should be encouraged to cultivate vegetables as well for profit as amusement.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. During the cold and rainy seasons the men wear the forage cap, cloth tunic, cloth trousers, woollen socks, cotton shirt, ankle boots, and great coat. In the hot season a wicker helmet, with quilted cover and turban, khakee cloth tunic and trousers, cotton shirt, cotton socks, and ankle boots. The accoutrements consist of rifle and bayonet, with scabbard; ammunition, reserve pouch, and shoulder belt; expense pouch, waist belt, cap, pouch, and knee cap. I consider the present dress suitable to the climate at all times and seasons. The present regulation dress is well adapted for all the varieties of stations in the presidency, provided proper attention is paid to have the changes made for cold and warm weather according to temperature. I would suggest, however, that the white light clothing in garrison be substituted for the khakee.
Duties.	1. I think it would be advisable that recruits should be thoroughly drilled at home before being sent to India.
	2. The usual routine of a soldier's duties is to mount in turn any guard told off for the regiment; to escort prisoners to jail; to act as orderly to his company in turn; to keep his clothing and accoutrements clean, and to attend drill when not on duty. Drills or parades evening and morning last one hour; each man carries 10 rounds of ammunition in his pouch. The men, in my opinion, should never be kept at parade or drill more than three quarters of an hour. The best hours for drills, parades, and marches, are from daylight to a little after sunrise, and in the evening from five o'clock till a little after sunset. There are general orders on these subjects. The men have from two to three and a half nights in bed during the week.
	3. One guard is mounted about 2½ miles from the barracks, and two others in the immediate neighbourhood. Guards last 24 hours by day and night; sentries are relieved every two hours. There are roll calls morning and evening. I cannot say that I have observed any bad effect on health caused by night guards.
VIII. INSTRUCTION AND RECREATION.	1. There are no means of instruction or recreation at the town barracks, but at Fort George barrack there is attached one ball court, one skittle ground, covered with mats, one school, with good schoolmaster, and library and reading room sufficiently lighted at night, and a small soldier's garden. The Colaba barracks have one ball court, a skittle ground, under a temporary verandah, and a school with good schoolmaster; while the depôt barracks have only a skittle ground, covered with mats. No workshops are attached to any of the barracks. Theatrical amusements are occasionally provided at Fort George and Colaba. Cricket is a favourite game among the men. I do not think the present means are sufficient to occupy the men during the rainy season, especially for those men unable to read or write. There are no special restrictions imposed on the men in regard to exposure to sun and rain when

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	off duty, but they cannot leave the barrack-yard except on pass, before five o'clock in the evening. 2. I would suggest that officers join the men in cricket, as the more they do so the better. There are now many officers who do so. In Fort George there is also a cricket club for the boys. 3. There are regimental savings banks established at Bombay, and these are of great advantage to the men. 4. No shade is afforded by trees at any of the barracks to enable the men to take exercise during the day, but there is ample shade afforded by the verandahs of the Fort George and Colaba barracks. There being only one verandah to the town barracks, the space for exercise is rather confined. There is no shade or shelter whatever at the depôt barracks.
X. Military Prisons.	1. The military prison answers its purpose very well, considering it has not been constructed *ab initio* for its present purpose, but is merely an adaptation of a portion of the House of Correction, which is essentially a jail for natives. A new building should have a more elevated site and efficient drainage, ample circulation of air all round, a verandah in front of the cells, boarded floors, and ventilators so constructed as not to tempt (as the present do) their entire closure with matting during the rainy season, when ventilation is most wanted. These arrangements might prevent the dysentery now so prevalent, and render outbreaks of cholera less frequent. With respect to lunatic soldiers, I may say that the lunatic asylum here is very unfitted for the reception and treatment of cases of this kind. It is incommodious and gloomy. But as, in my opinion, soldiers who once require restraint of this nature are ever after ineligible for the ranks, and it is an object to send these patients to England by the first opportunity, the imperfections of the lunatic asylum are of little importance in a military point of view.
X. Field Service.	1. There are no local regulations for field medical service. 2. With regard to the powers of the medical officers on the line of march, camping, &c., every attention is paid to their recommendations and representations. 3. The medical officer can suggest anything he thinks proper for the preservation of the health of the troops under his charge to his commanding officer. This is usually referred to the deputy inspector-general at the presidency, who recommends to the brigadier-commandant of the garrison any improvement he considers to be necessary. 4. Field hospitals are not required at the presidency; sick European troops arriving are taken to the Colaba sanitarium; the natives to the Marine Battalion Hospital. The sick are transferred on arrival, in buggies and palanquins, according to the nature of the case. Hospital supplies are procured on requisition from the commissariat department.

XI. STATISTICS OF SICKNESS AND MORTALITY.—BOMBAY.

European Troops.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1850–51	L. W. H. M. 78th Highlanders	519	183	4	—	—	18	1	56	4	293	8	7	—	42	15	357	—	956	32	184·2	6·1
1851–52	Do. do.	535	66	2	1	1	13	2	123	3	481	8	5	1	1	1	339	3	1,029	21	192·3	3·9
1852–53	Do. do.	393	276	1	—	—	14	—	49	6	361	7	8	—	—	—	288	1	996	15	253·4	3·8
1854–55	R. W. H. M. 83rd Regiment	45	17	—	—	—	2	—	1	—	7	1	1	—	—	—	35	—	63	1	140·0	2·2
1855–56	Wg. H. M. 83rd do. Wg. do. 86th do.	561	349	—	—	—	55	3	33	—	137	2	50	6	5	4	546	2	1,175	17	209·4	3·0
1856–57	Do. do.	447	473	2	—	—	73	3	57	3	141	3	23	1	—	—	356	3	1,123	15	251·2	3·3
1857–58	H. M. 8th Hussars Do. 33rd Regiment Do. 51st do. Do. 71st Highlanders Do. 72nd do. W. G. H. M. 86th Regiment Do. 92nd Highlanders Do. 95th Regiment	2,119	87	1	6	—	79	—	13	1	79	1	13	2	—	—	440	1	717	6	33·8	0·2
1858–59	H. M. 28th Regiment Do. 57th do. Do. 86th do. Do. 92nd Highlanders	912	1,517	1	1	1	31	—	12	1	76	3	22	—	—	—	584	—	2,243	6	245·9	0·6
1859–60	Do. 28th Regiment Do. 86th do.	634	376	6	1	—	37	4	15	—	124	10	8	—	—	—	511	4	1,072	24	169·0	3·7
	European Troops in the Indian Army.																					
1850–51	2nd Battalion Artillery	157	176	—	—	—	20	1	16	1	85	12	22	2	10	6	267	—	596	22	379·6	14·0
1851–52	Do. do.	74	32	—	—	—	7	—	13	—	52	4	1	—	—	—	81	2	186	6	251·3	8·1
1852–53	Do. do. L. W. 1st Bombay European Regiment Fusiliers.	221	86	1	—	—	28	1	11	—	68	1	16	1	—	—	294	2	503	6	227·6	2·7
1853–54	2nd Battalion Artillery R. W. 1st Bombay European Regiment Fusiliers.	543	222	2	2	1	38	5	71	7	183	3	30	1	2	—	593	7	1,141	26	210·1	4·7
1854–55	2nd Battalion Artillery R. W. 1st Bombay European Regiment Fusiliers.	450	239	2	—	—	30	1	46	5	192	8	80	—	1	1	523	5	1,111	22	246·8	4·8
1855–56	2nd Battalion Artillery	146	136	—	—	—	28	—	23	—	70	3	11	—	—	—	206	1	474	4	324·6	2·7
1856–57	Do. do.	123	135	1	—	—	19	—	22	5	83	7	16	2	1	—	156	—	432	15	351·2	12·2
1857–58	Do. do.	31	29	—	—	—	9	—	6	—	15	—	4	—	1	—	59	1	123	1	396·7	3·2
1858–59	Do. do. 4th Company 1st Battalion Artillery	40	21	—	—	—	12	1	6	—	13	—	11	1	—	—	51	—	114	2	285·0	5·0
1859–60	2nd Battalion Artillery 4th Company 1st Battalion Artillery 2nd European Regiment L. I.	233	86	1	—	—	35	3	9	1	102	7	20	1	13	8	205	—	474	21	203·4	9·0

Native Troops.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1850-51	L. W. 1st Grenadier Regiment N. I. 5th Regiment N. I. 8th do. Head Quarters 14th do. 22nd do. 28th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,496	1,047	7	15	—	65	9	9	1	326	13	27	2	26	17	1,149	7	2,664	56	106·7	2·2
1851-52	6th Regiment N.I. 8th do. 14th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,728	792	4	13	—	51	1	6	—	419	11	37	1	28	15	1,197	14	2,543	46	93·2	1·6
1852-53	6th Regiment N. I. 8th do. 12th do. 13th do. 14th do. 16th do. Marine Battalion 6th Company 3rd Battalion Artillery Gun Lascars 2nd Batalion Artillery	2,798	1,081	11	17	1	67	5	11	2	356	13	27	—	2	2	1,066	13	2,627	47	93·8	1·6
1853-54	5th Company 4th Battalion Artillery 6th do. 3rd do. 12th Regiment N.I. 13th do. 16th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,594	1,785	14	19	—	68	4	9	2	411	8	35	1	79	39	1,127	12	3,533	80	136·1	3·0
1854-55	5th Company 4th Battalion Artillery 12th Regiment N. I. 13th do. R. W. 16th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,589	2,493	26	18	—	102	4	13	1	370	9	29	3	36	18	1,275	13	4,336	74	167·4	2·8
1855-56	5th Regiment N. I. 11th do. 12th do. 13th do. 15th do. 16th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,887	3,407	9	39	2	126	10	17	3	647	6	24	2	26	9	1,882	10	6,170	51	213·7	1·7
1856-57	Aden Troop 5th Regiment N. I. 11th do. 15th do. Marine Battalion Gun Lascars 2nd Battalion Artillery	2,834	3,082	13	44	1	135	11	27	3	846	12	39	1	31	10	2,164	25	6,008	76	211·9	2·6
1857-58	1st Grenadier Regiment N. I. 23rd Regiment N. I. Marine Battalion Gun Lascars 2nd Battalion Artillery	1,784	1,117	9	34	1	95	3	9	2	492	9	29	2	3	1	1,125	7	2,904	34	162·7	1·9
1858-59	1st Grenadier Regiment N. I. 2nd do. do. 7th Regiment N. I. 23rd ,, Marine Battalion Gun Lascars 2nd Battalion Artillery	2,469	2,250	10	39	—	119	7	7	1	289	3	17	3	1	1	1,248	9	3,970	34	160·7	1·3
1859-60	2nd Grenadier Regiment N. I. 7th Regiment N. I. Marine Battalion Gun Lascars 2nd Battalion Artillery	1,987	2,806	14	13	1	72	5	13	1	265	3	19	1	33	16	1,345	7	4,566	48	229·7	2·4

Women and Children.

Years.	CORPS.	WOMEN. Strength. Europeans.	WOMEN. Strength. Indo-Europeans and Natives.	WOMEN. Strength. Total.	WOMEN. Treated. Europeans.	WOMEN. Treated. Indo-Europeans and Natives.	WOMEN. Died. Europeans.	WOMEN. Died. Indo-Europeans and Natives.	WOMEN. Ratio per Cent. to Strength. Treated.	WOMEN. Ratio per Cent. to Strength. Died.	CHILDREN. Strength. Europeans.	CHILDREN. Strength. Indo-Europeans and Natives.	CHILDREN. Strength. Total.	CHILDREN. Treated. Europeans.	CHILDREN. Treated. Indo-Europeans and Natives.	CHILDREN. Died. Europeans.	CHILDREN. Died. Indo-Europeans and Natives.	CHILDREN. Ratio per Cent. to Strength. Treated.	CHILDREN. Ratio per Cent. to Strength. Died.
1852-53	Wg. H. M. 78th Highlanders	80	8	88	63	11	2	—	84·1	2·2	116	9	125	72	9	3	1	64·8	3·2
1855-56	Head Quarters H. M. 86th Regiment	74	5	79	65	6	—	—	89·8	—	145	6	151	77	10	13	1	57·6	9·2
1856-57	Do. do.	73	2	75	130	2	4	—	178·6	5·3	138	3	141	195	—	7	—	138·2	4·9
1852-53	2nd Battalion Artillery	18	8	26	34	5	1	—	150·0	3·8	19	14	33	19	2	3	1	63·6	12·1
	L. W. 1st Bombay European Regiment Fusiliers.	25	19	44	5	5	—	—	22·7	—	40	22	62	4	—	1	—	6·4	1·6
1853-54	2nd Battalion Artillery	18	9	27	43	4	2	—	174·0	7·4	25	17	42	16	3	3	—	45·2	7·1
	R. W. 1st Bombay European Regiment Fusiliers.	22	18	40	29	17	—	—	115·0	—	33	17	50	18	6	4	1	48·0	10·0
1854-55	2nd Battalion Artillery	14	8	22	26	15	2	—	186·3	9·0	34	12	46	49	19	1	—	147·8	2·1
	R. W. 1st Bombay European Regiment Fusiliers.	23	18	41	28	15	1	—	104·8	2·4	24	23	47	13	9	5	3	46·8	17·0
1855-56	2nd Battalion Artillery	16	8	24	12	11	—	—	95·8	—	26	16	42	19	9	1	2	66·6	7·1
1856-57	Do. do.	15	9	24	27	11	—	—	158·3	—	19	14	33	6	1	2	—	21·2	6·0
1857-58	Do. do.	6	2	8	16	2	1	—	225·0	12·5	10	3	13	—	3	—	1	23·0	7·6
1858-59	Do. do.	4	1	5	6	3	—	—	180·0	—	8	1	9	4	—	—	—	44·4	—
1859-60	4th Company 1st Battalion Artillery	4	2	6	6	1	—	1	116·6	16·6	3	2	5	4	2	—	—	120·0	—
	2nd Battalion do.	7	2	9	7	6	—	1	144·4	11·1	12	3	15	5	5	1	—	66·6	6·6
	2nd European Regiment L. I.	48	2	50	16	—	—	—	32·0	—	64	7	71	9	—	—	—	12·6	—
	Depôt European Troops	9	6	15	9	9	—	—	120·0	—	11	6	17	6	2	—	—	47·0	—

By order of the Principal Inspector-General, Medical Department,

W. C. Coles,
Assistant Surgeon, Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1861.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1. Plans and sections of the Fort George, Colaba, and depôt hospitals are transmitted, but there being no separate building for an hospital, a division of the upper story of the town barrack is sometimes used for that purpose. Fort George hospital is about 300 feet from the barracks to the west, and about the same distance from the stables to the south. The Colaba hospital is about 300 feet to the south-east of the barracks, and the depôt hospital about 1,550 feet to the north-east of the barracks. The European hospitals are at some distance from the bazaar, but the latter is close to the native hospitals. The sites of the buildings are generally good with the exception of the hospital of H.M.'s 56th regiment at Colaba, which has been built on low ground close to the sea. The drainage of Bombay is generally defective. 3. The water supply of the hospitals is wholesome in quality, but it has hitherto become scanty towards the end of the hot season. The wells and tanks will now, for the future, be kept filled with excellent water supplied by a large reservoir called the Vehar lake, some 15 miles distant, and brought in through cast-iron pipes. There is an intention of supplying the hospitals and barracks direct from this source. 4. The means of drainage employed for removing refuse water and other impurities from Fort George hospital are through open drains into the ditch, and through covered drains into cesspools; ordure from necessaries is conveyed away by buckets, which are emptied into the sea at the rear of the barracks at a distance of about 400 feet from the hospital. Colaba hospital is drained through open and covered drains which empty themselves into the sea, ordure from the necessaries is conveyed to the sea at a distance of from 100 to 120 feet. The depôt hospital refuse water, ordure, &c., is received into cesspools, which are emptied and cleaned when required. The refuse water from the cook-house is conveyed through a covered drain to the sea at a distance of 150 feet. 5. The lowest wards of Fort George hospital are raised above the ground about six feet, and there is free perflation of air underneath the floor. At Colaba and the depôt hospitals the lowest wards are raised about two feet above the ground, and there is no free perflation of air underneath the floors. At Fort George hospital there is no provision made for carrying away the roof water; it therefore sinks into the ground or escapes into the ditch and tanks. Wooden gutters are fixed on the roof of Colaba hospital for conveying the water into covered drains leading into a tank for use. There is no provision made for conveying away the roof water of the depôt hospital; it, therefore, sinks into the ground or escapes into the sea. There is no guttering round Fort George hospital. The ground slopes towards a tank in front, into which the water falls, and in the rear the water escapes into the ditch which is all that is required. At Colaba hospital wooden gutters are placed along the eaves from which the roof water is conveyed through wooden pipes into masonry drains, and these empty themselves into the tank; there are also open drains to convey the surface water to the sea, by which means the ground is always free from pools of water. The ground slopes from the depôt hospital towards the sea into which the surface water falls, and this is found to be sufficient. The foundations and walls below the floor of wards of Fort George hospital are built of lime and stone masonry; the walls of verandahs are of single brick six inches thick; the main walls consist of teak posts on which the roof is supported, and double bamboo plastered on both sides with chunam. The roof is of teak wood trussed with double tiles, and having dormer windows for ventilation, &c.; the roof and walls are sufficiently thick to keep the hospital cool. The foundations and superstructure of Colaba hospital are of stone and lime masonry, single walls, plastered inside and out; the roof of teak wood trussed with double tiles, and both roof and walls sufficiently thick for coolness. The foundations and plinth of the depôt hospital are of stone and mud, and plinth up to the posts of stone and lime masonry; the walls are of double bamboo plastered on both sides with chunam, the roof is supported on teak round posts, and is made of teak wood trussed with bamboo battens and double tiles; ventilators with glazed shutters, fixed close up to the wall plates, and roof and walls sufficiently thick for coolness. There is a closed verandah on the east and west sides of Fort George hospital with glazed and plank shutters. The former eight feet wide, and the latter nine feet wide, and sufficient shelter from the sun's rays is afforded. At Colaba there is a verandah 10 feet wide all round with teak plank shutters, &c., and sufficient shelter from the sun's rays. A verandah 12½ feet wide is fixed all round the depôt hospital, and is sufficient shelter from the rays of the sun. The verandahs of the military European regimental hospitals are not used for the accommodation of sick convalescents, or others, except for their own convenience or on extraordinary occasions of sickness. Fort George hospital consists of one flat or ground floor raised on arches about 6 to 7 ft. in height; Colaba and depôt hospitals of one flat or ground floor each.

Table of Hospital Accommodation.

Wards or Hospital Huts, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
*Fort George Hospital.**		Ft. In.	Ft. In.	Ft. In.	Feet.			Ft. In.			
1st ward - - -	15	105 2	22 0	12 10	29,692	1,979	154	1 8	18	8	4
2nd do. - - -	10	70 6	22 0	12 10	19,904	1,990	155	1 8	11	8	4
3rd do. - - -	5	38 3	22 0	12 10	10,799	2,159	168	1 8	5	8	4
4th do. - - -	3	19 0	22 0	12 10	5,364	1,788	139	1 8	1	8	4
5th do. - - -	7	54 0	22 0	12 10	15,246	1,298	169	1 8	4	8	4
6th do. - - -	4	31 3	22 0	12 10	8,822	2,205	171	1 8	4	8	4
7th do. - - -	10	75 0	22 0	12 10	21,175	2,117	165	1 8	7	8	4
8th do. - - -	4	31 6	22 0	12 10	8,893	2,223	173	1 8	3	8	4
Total -	58	—	—	—	—	—	—	—	53	—	—

* Date of construction 1839-40; total number of wards, 8; total regulation number of beds, 58.

BOMBAY.

Table of Hospital Accommodation—*cont.*

Wards or Hospital Huts, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
*Colaba Hospital.**		Ft. In.	Ft. In.	Ft. In.	Feet.						
1st ward	6	50 0	20 0	12 6	12,500	2,082	166	1 8	4	5	3
2nd do.	6	50 0	20 0	12 6	12,500	2,082	166	1 8	4	5	3
3rd do.	6	50 0	20 0	12 6	12,500	2,082	166	1 8	4	5	3
4th do.	6	50 0	20 0	12 6	12,500	2,082	166	1 8	4	5	3
5th do.	8	50 0	25 0	12 6	15,625	1,953	156	1 8	5	5	3
6th do.	8	50 0	25 0	12 6	15,625	1,953	156	1 8	5	5	3
7th do.	8	50 0	25 0	12 6	15,625	1,953	156	1 8	5	5	3
8th do.	8	50 0	25 0	12 6	15,625	1,953	156	1 8	5	5	3
Total	56	—	—	—	—	—	—	—	36	—	—
Depôt Hospital.†											
1st ward	20	105 0	24 0	16 6	41,580	2,079	126	1 8	20	4	3
2nd do.	20	105 0	24 0	16 6	41,580	2,079	126	1 8	20	4	3
3rd do.	20	105 0	24 0	16 6	41,580	2,079	126	1 8	20	4	3
4th do.	20	105 0	24 0	16 6	41,580	2,079	126	1 8	20	4	3
Total	80	—	—	—	—	—	—	—	80	—	—

* Date of construction, 1822-24, 1829, 1835, 1836, and 1841; total number of wards, 8; total regulation number of beds, 56.
† Date of construction, 1858-59. Total number of wards, 4; total regulation number of beds, 80.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The ramparts of Fort George hospital partially obstruct the south-west wind. The Colaba and depôt hospitals each receive the benefit of prevailing winds; the windows in all these hospitals open outward on hinges with opening hooks and eyes, and their arrangement is conducive to ventilation and coolness.
	6. Fort George hospital is ventilated by dormer windows in the roof, and by the doors and windows in the walls; these, with the punkahs going, are sufficient to keep the wards at all times free from odour or closeness. Colaba, by ventilators on the roof, and by the doors and windows in the walls, and also supplied with punkahs. Depôt, by ventilators in the walls, and also by the doors and windows; the wards are always free from odour or closeness by these means. There are no jalousies or jhilmils to any of the hospitals.
	7. The means of cooling the air admitted into the wards are by punkahs or large swinging fans.
	8. In the damp chilly weather means of warmth are supplied by charcoal burners, which are used also in the barracks. The walls and ceilings of the hospital wards are cleaned and whitewashed every three months.
	9. At Fort George hospital the privy is about 10 feet to the south-west, and consists of a row of seats with covers, having earthenware pots underneath, which are emptied twice daily into buckets, and the contents thrown into the sea behind the barracks; water-closets are about 10 feet to the south-west of the hospital. The urinals, which are tubs with iron handles, are carried behind the barracks and there emptied. The water from the washing of the pots is allowed to run into the ditch. They do not appear to be offensive, no water is supplied to them, nor are they placed over cesspits. The privies at Colaba hospital are from 40 to 80 feet south-west, with plank seats, under which buckets are placed which are emptied into the sea daily. The water-closet is about 30 feet to the south-east. The urinals are of a similar description to those at Fort George, and are also emptied into the sea daily. They are not supplied with water, nor placed over cesspits, nor are they offensive; they are properly drained. At the depôt hospital the privies abut against the verandahs on the south and north sides, and have plank seats and a masonry trough underneath to hold water; the contents are received into cesspits, which are emptied daily. Water-closets are about 10 feet from verandah, and under the same roof as the bathing rooms, the waste water from the latter running through the urinaries. The contents of the urinals, &c., are received into cesspits, which are emptied when full. They are not placed over the cesspits, but near them. They are not offensive.
	10. The bathing places at Fort George are four in number with terraced floors, off the south-west verandah, where the patients can bathe themselves from water-barrels; these are sufficient. At Colaba there is one lavatory near the rear verandah with flagstone floor. A large wooden trough lined with zinc is fitted up next one of the walls, which is supplied with water from an iron tank outside the ball-cock. From this trough the patients take the water to bathe themselves with; this arrangement seems sufficient. There are two lavatories detached from the depôt hospital, which are divided into several small compartments with mats nailed on wooden framework, so that each patient may bathe himself without being exposed to the gaze of the others. The water is supplied in barrels or tubs. The floor is terraced.
	11. The sick generally pour the water over themselves with a tin pot. The water is supplied in troughs or tubs placed in the lavatories.
	12. The washermen take the clothes to a distance, where they wash and dry them. Outside Fort George hospital in the neighbourhood there are public washing places; which answer the purpose well.
	13. The storage is sufficient and dry.
	14. Iron cots laced with cotton tape are now in use in the hospitals; there are some older ones banded with flat iron bars. The former construction answers the purpose well.
	15. The hospital kitchens are generally to leeward of the hospital, and sufficiently large. Cooking pots, gridirons, and other appliances sufficient. The diets might be more varied; mutton might be allowed twice during the week as a change.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	16. Copies of the diet-tables, diet-rolls, and all other returns required for working the internal economy of the hospital, &c., are forwarded. 17. The provision for attendance on the sick consists of a hospital serjeant, and a nurse or native boy generally for each bedridden patient. There is also a European female nurse or matron for the sick females and children. 18. The sanitary condition of the hospitals is generally good, and no epidemic disease, hospital gangrene, or pyæmia, have appeared in the wards. 19. There are no other deficiencies or sanitary defects which have come under my notice as medical attendant. 20. There is no special provision made for convalescents taking exercise, but an allusion to Fort George artillery hospital will show certain accidental advantages in this respect. The floor of the wards is on a level with the ramparts, which lie against the rear of the hospital, and looking far out on the esplanade afford a cheerful and airy place of resort for the patients. There is also space on the other side of the hospital where the convalescents take exercise without being able to reach the barracks unobserved. Trees have been planted during the last two or three years. Fort George, as well as being the artillery quarters, was till lately the depôt of all the company's European troops. An invalid, though he may not require treatment, is never allowed to live in barracks excused from all duty. If he is not fit for light duty, he is always kept in hospital. 21. The arrangements made for the treatment of soldier's sick wives and children are quite equal to those of the men, and at present quite satisfactory. 22. There are no special local hospital regulations enforced which are not included in the general presidency medical regulations. 23. In matters appertaining to the sanitary state of the hospitals, to repairs in buildings, to change of diet, and to medical comforts within the hospitals at stations, camps, and on march, the medical officers have full powers, subject to the sanction and control of the deputy inspector-general of hospitals of their division. 24. There are no convalescent wards or hospital for convalescents at the stations, and allowing men convalescent in barracks does not answer well. Patients are better kept in hospital till they are fit for duty.
XIII. Burial of the Dead.	1. There are four burial grounds used by British troops, viz., one Roman Catholic and three Protestant; of the latter two are more especially episcopalian and one presbyterian; they all lie on the ocean side of the island, and have nothing intervening between them and the sea beach, except the presbyterian, which is crowded in by native hospitals and dwelling houses all round. 2. The area of the burial ground in charge of the trustees of the cathedral church is 16,648 square yards, soil sand, subsoil sand; drainage good; decomposition rapid; the ground is well kept under trustees. 3. The regulations as to burial are as follows:—The graves are made according to the size of the coffins, with about 3 feet between them, and between 5 and 6 feet deep; in the monsoon water prevents any deeper digging, and in the dry weather the sides fall in; graves are now never re-opened, except to receive the bodies of relatives of the family. The whole ground has, however, many times been covered with graves. Compulsory interment ordinarily takes place within 24 hours; when necessary, within 12 or even 6 hours. The same rules are in force with reference to burial grounds used by native troops. 4. The grave yard is never offensive. The practice as regards the burial of British troops is this, viz., the bodies of non-commissioned officers and privates are taken from the place where they died direct to the burial grounds. Those of commissioned officers first to the church, and then to the burial ground; all funerals take place in the cool of the morning and evening. 5. The dead of the camp followers or bazaar people are burnt; some few, including Mussulmen, are buried. 6. No injury to the public health accrues from the present practice. 7. I could not suggest any improvements in the way of regulation or otherwise in the burial or disposal of the dead.

(Signed) C. S. Stuart, Brigadier.
J. J. Hamilton, Deputy Inspector General of Hospitals.
1st May 1860. Edm. Southey, Captain, Garrison Engineer.

MHOW.

Accommodation — Queen's Troops — Artillery - - - 300
Queen's Troops — Cavalry - - - 400
Queen's Troops — Infantry - - - 1,400
Native Troops — Infantry - - - 1,600

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is undulating, partly cultivated and partly covered with small bushes. It is hilly and dry. There is no wood, jungle, or water in the immediate vicinity. 2. The elevation of the station above the sea is 1,862 feet, and from 100 to 200 feet above the adjacent country. Two rivers, dry in the hot season, bound the cantonment. The nearest river is the Nerbudda. There is no canal, nullah, nor marsh near the station. The edge of the Ghaut is higher than the station, but no better site for the camp exists. 3. The station is on table land. The edge of the Jam Ghaut, 12 miles distant from Mhow, is 2,328 feet above the level of the sea. 4. The Nerbudda is the nearest river; it is 27 miles distant at Burwai, the nearest point. The river does not overflow its banks. There are ravines and broken ground near the station. 5. It is open and freely exposed to winds, and nothing interferes with the ventilation. The temperature is not raised by the buildings being exposed to reflected sun heat. The station is exposed to variable winds, which, in the cold season, are cold and northerly. The pre-

MHOW. BOMBAY.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY—*cont.*	vailing wind, however, is from the west, and is more agreeable to the feelings and more healthy than from any other quarter. 6. The country is only partly cultivated near the camp. There are no works of irrigation nearer than 12 miles. Rice is not cultivated in Malwah, nor any hemp nor indigo near the station. 7. Indore, 14 miles distant, is the nearest city. 8. The geological structure is a trap formation, with a surface of water-worn pebbles and clay. Morum and black soil are found in the depressions; the latter is seldom more than three feet in depth. No former town existed on the site of the cantonment or near it. 9. During the dry season water is usually found at from 40 to 50 feet below the surface, and in the rainy season at from 10 to 15 feet. 10. The rainfall runs off readily. There is no adjacent high ground, the drainage from which passes into the subsoil. 11. The water supply is derived from wells, and there are no tanks near the station. 12. The supply of water is not plentiful, but it is good. Its composition varies in different wells; but good, pure, and wholesome water can always be procured. It has not been examined microscopically nor chemically. It is drawn and distributed by bheesties in the usual manner. No better water is to be obtained near the station. 13. There is no other topographical point of consequence to be mentioned. 14. No new stations have been selected within the Bombay Presidency for the last 20 years.
II. CLIMATE.	1. The means and instruments available for meteorological observations are the pluviometer, barometer, and thermometers, with wet and dry bulb. 2. The following Table gives the observations from April 1859 to March 1860:—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain Inches.	Winds. Direction.	Winds. Force.	Day of Sunshine.
	Inches.	°	°	°	°	The fall of rain last year was between 17 and 18 inches. The average fall is supposed to be about one-third more.			Not observed.
January 1860	28·2	70	10	75	65		N.E.	Moderate.	
February „	28·1	71	9	77	68		E., N.W.	Moderate.	
March „	28·1	80	11	85	75		W., N.W.	High wind.	
April 1859	28·1	86	13	92	79		N.W.	High wind.	
May „	27·9	87	17	95	78		N.W.	High wind.	
June „	27·8	74	17	85	64		N.W.	Monsoon.	
July „	27·7	82	7	86	78		N.W., and variable.	Monsoon.	
August „	27·8	75	3	77	74		N.W.	Monsoon.	
Sept. „	27·9	75	4	78	73		N.W.	Moderate & calm.	
Oct. „	28·0	77	7	81	74		N.W., N.E.	Calm.	
Nov. „	28·1	75	5	78	73		E.S.E.	Calm.	
Dec. „	28·1	71	6	74	67		E·N.E.	Calm.	

Thermometer kept in a substantial building, highest 98°, lowest 62°, aneroid barometer.

References to Subjects and Queries.	REPLIES.
	3. The climate has always been considered good, dry, and cool. Few trees have been planted lately, but in some parts of the camp there are fine old trees. Except in gardens, there is no irrigation. The atmosphere is seldom loaded with dust. The health of the troops is affected at the change of the season, when fevers and bowel complaints prevail. The diet should be generous, without being over-stimulating, and with a good proportion of vegetables. The shelter is as yet imperfect, but is improving. The loose clothing is a great improvement. Drills, duties, and exercises are not excessive, and the drills are suited to the season of the year. The monsoon month, and more especially towards its termination, when fevers and bowel complaints prevail, are the most unhealthy. The end of the cold season and the beginning of the hot are the most healthy. 4. There is no adjacent district more conducive to health than the station. 5. The stations I have served on are Sholapore, Poona, Kurrachee, Baroda, and Aden, in the Bombay Presidency, and Peshawur and Gwalior in Bengal. Sholapore and Poona were the most healthy.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Maps and plans. 4. The barracks at present occupied by the troops being temporary buildings, it is impossible to fill up the annexed form correctly. 5. The windows are on opposite sides of the rooms, and open windwards. There is a verandah 10 feet wide on an average. It is not occupied as sleeping quarters. There are properly constructed jalousies or jhilmils. 6. The regulation bedstead, used by the troops at Mhow, consist of 3 plain boards, each 6¼ feet long, 10 inches broad, and 1 inch thick, supported on 2 iron trestles 18 inches high. For durability, cleanliness, and comfort, it is considered they cannot be surpassed. The bedding consists of 1 pair of blankets or cumblies, 1 cotton rug, 1 cotton quilt, 2 cotton sheets, 1 cotton pillow with 2 pillow-cases. This bedding is found not to be sufficiently warm in the cold season. Instead of 2 cumblies, 1 good English blanket should be substituted; and mattress and pillows of hair, or cocoa-nut fibre, would be preferable to those now in use. 7. The structure and dimensions of the tents used in camp are as follows:—

	Cubic Contents.			Superficial Area.			Cubic Space per Man.	Superficial Space per Man.	Number of Men in each.
	Yds.	Ft.	Ins.	Yds.	Ft.	Ins.	Feet.	Feet.	
European hospital tent, double walled	74	5	1,516	33	5	9	100	16	20
Native hospital tent, single walled	75	23	756	39	5	36	102½	16	20
European soldier's tent, double poled	72	8	1,219	37	6	72	89	15½	22
European soldier's tent, single poled	39	13	1,152	19	6	128	81	13¾	13
Native soldier's tent, double poled	48	23	1,368	31	1	74	66	14	20
Native soldier's tent, single poled	19	17	720	11	7	12	53	10	10
Staff Serjeant's	22	1	0	11	6	9	594	105	1

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	8. Ventilation is obtained by openings in the roof of the barracks, and is sufficient to keep the air pure by night as well as by day. The climate of Mhow renders any contrivance for cooling the air unnecessary. 9. The troops are at present in temporary barracks, constructed with either burnt or sun-dried bricks, and with tiled or thatched roofs. 10. The floors are of lime, raised 1½ feet above the surface of the soil on an average. There is no passage for air beneath. 11. The new barracks will be constructed with stone, a better material than brick for resisting heat. The executive engineer is responsible for the buildings. The officer in command for the general sanitary state. The repairs are made quickly, and the barracks are cleansed and lime-washed every 9, 10, or 12 months, seldom at longer intervals. 12. The baths are drained into a cesspit, and the water taken away by bheesties. Three wash-houses of this description are in camp. 13. The cookhouses are temporary buildings drained in a similar manner. No conveniences for washing linen exist in the Mhow cantonment. 14. The contents of the privies are removed behind. Some of the urinals have cesspits similar to the washhouses. 15. All the buildings are ventilated by openings in the roof. They are generally sufficiently light in the day, and at night oil lamps are supplied. 16. No made drains or sewers exist, but the buildings are on sloping ground. They are kept clean by means of carts and bheesties. No part of the barracks or hospital is damp. The drainage is received into cesspits in some instances and removed. None of the cesspits are nearer the wells than 200 yards. They are 50 feet from the nearest quarters, and are cleaned every morning. There are no foul ditches. 17. The surface cleansing is done by the barrack-master, who has an establishment *constantly* employed for the purpose. 18. The surface of the cantonment is kept free from vegetation. There are no old walls, hedges, &c., interfering with ventilation. 19. From the fact of there never being any sickness in the bazaar of a serious nature, it does not appear that the sanitary measures at present in force could be improved on. The drainage is good, and water plentiful. The ventilation would be better if the street had been built endways towards the prevailing wind, instead of laterally. Sweepings of all descriptions are put into heaps and carried away by the conservancy carts. The houses are for the most part well built and airy. There are no dungheaps or cesspits within them. No nuisance is experienced from wind blowing over the native dwellings. 20. Animals are slaughtered well to leeward of the station, about half a mile. The kites and vultures carry off the offal, and the place is clean and no nuisance experienced from it. 21. Any horses belonging to residents in the bazaar are picketed in or near the Dhurrumsula. There are no horses attached to the bazaar. The manure heaps are carried away by the conservancy carts. 22. The horses are placed to leeward of the men's barracks. Those of the cavalry and artillery are not in stables. Dungheaps are a quarter of a mile distant. It is sold to the brick-makers, and by them removed. 23. Married soldiers are in temporary patcherries.
Officers' Quarters.	1. The officers' quarters, which are in low situations, are damp during the rains. The houses are well ventilated and generally healthy. The dampness in some parts of camp during the rains might in some measure be obviated by improved drainage, and this measure is about to be carried out.
IV. Health of the Troops.	1. The station, the district, and the adjoining native population are healthy. 2. The prevalent diseases are fevers, with occasional spleen affections, small-pox, and occasionally cholera. 3. I attribute the healthiness of the natives to the elevated site, dry and cool climate, and the abundance and cheapness of the necessaries of life. 4. The European part of the garrison is recently from Europe, and these enjoyed good health. They arrived in good health, and have suffered chiefly from fevers and bowel complaints since arrival. There is a deficiency of accommodation at the station, but no part is considered more unhealthy than the rest. 5. The troops are never camped out. 6. I have never been in charge of tropical hill stations, and have no experience of them. 7, 8, 9. As stated above, I have no experience. 10. Great precautions must be necessary for troops at hill stations, but I cannot speak from experience. 11, 12, 13. No reply. 14. Undoubtedly it would be desirable to locate troops on the hills as much as possible. 15, 16. No experience. 17. There is no higher ground near this station which could be advantageously occupied. 18. A friable, light, porous soil is the most healthy for stations. 19. A mature age is the best for soldiers proceeding to India. Troops are disposed of on arrival in every respect as the regiment to which they are posted. At the sea port on first landing they have not always these advantages, and suffer accordingly. The best precaution for preserving the health of recruits, if the season will permit of it, is to remove them as speedily as possible and send them to join their regiment. 20. If there were proper intermediate stations, it would be well to locate troops in them for a time before proceeding to India. They should be prepared gradually to encounter the heat of the plains. 21. The mode of transport for troops from the port to the interior varies. Some must proceed by water, others by land, to join their regiment, according to the station it may be at. 22. If every European soldier has the benefit of a furlough to Europe after 10 or 12 years, he will complete 20 years' service with ease. 23. I never saw any bad consequences arising from difference of opinion on medical boards. The majority always forms a fair judgment. 24. The spring is the best time for invalids to leave India for home.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.* *Diseases.*	1. There are inspection parades once a week for the discovery of disease. 2. There is no considerable amount of scorbutic disease at this station. I attribute its occurrence to a deficiency of vegetables and fruits such as European soldiers are accustomed to and care for; and I recommend potatoes as the best anti-scorbutic, and which soldiers never tire of, to be issued as part of the ration throughout the year. 3. The sea-side predisposes less to hepatic diseases than high and dry climates. Stimulating food and drink also predisposes to them, and these form strong reasons for improving the vegetable portion of the ration, and substituting malt liquor for ardent spirits. The proportion of hepatic disease to other diseases usually under treatment is 3 per cent. 4. Dracunculus is rare, and not of much importance at this station. 5. Venereal cases have been as high as 60 per cent. of the sick, and as low as 8 per cent. Lock hospitals, with a good conservancy police, should be established wherever there are European troops. 6. Troops at this station suffer both from epidemic and endemic disease, chiefly the latter. Cholera, however, often appears as an epidemic, and also small-pox. Fevers are intermittent and remittent, and occasionally continued. Dysentery prevails to no great extent, and is endemic; it yields about 2 per cent. of treated and 5 per cent. of deaths. Cholera appeared epidemically last year, but not in any alarming degree. One half per cent. of cases treated, and 25 per cent. of deaths. Small-pox is neither observed as an epidemic nor endemic disease. Rheumatism is about 4 per cent. of treated and 4 per cent. of deaths. 7. The more frequent zymotic diseases are febrile complaints and disorders of the alimentary system. Fevers prevail from June to November; bowel complaints from July to October. A high temperature precedes their appearance, and damp weather, with considerable alternation of heat and cold accompany them. The station has always been considered a healthy one, and zymotic diseases are never unusually prevalent. The sanitary condition of the native dwellings in the bazaar and elsewhere may be considered satisfactory; the water supply, cleanliness, and drainage are well attended to. The crowding of native houses is always great, and their ventilation might be improved. There is nothing remarkable in the habits of either troops or natives to predispose them to zymotic disease. 8. Epidemic disease is always aggravated by irregular habits, crowding in barracks, and inferior accommodation, and the barracks here are very indifferent. 9. Quinine has not been given as a prophylactic against malarial disease. 10. Every caution is now taken in preserving cleanliness, improving the ventilation and drainage, and above all in providing the troops with proper shelter from the elements; and these should all be sedulously persevered in. Proper barracks are now in course of erection.
V. INTEMPERANCE.	1. There are no incorrigible drunkards at this station, although a few men are much addicted to drinking. 2. There are no data from which a table could be prepared to show the proportion of admissions to hospital caused directly or indirectly by intemperance. Drunkenness is punished as an offence. 3. Spirits are sold at the canteen to European soldiers, and in the bazaar are only permitted to be sold to natives. Europeans are permitted to purchase two drams of arrack daily at the canteen. Spirit is not used as part of the soldier's ration, but he is allowed to purchase in quarters from the canteen, and from the Commissariat when there is no canteen. No spirits are issued before the usual dinner hour. Spirits are *not* given as a ration to convalescents. No other drinks injurious to health are sold at the canteen or bazaar. 4. Spirits are seldom under any circumstances conducive to health, and not rarely very injurious. They are not conducive to discipline. 5. It would be very beneficial to restrict or abolish the use of spirits; malt liquor is far better. 6. Malt liquor or wine would be certainly beneficial as compared with spirits. 7. Coffee, tea, and soda-water are in general use, and their influence is beneficial to health and discipline as compared with spirits and malt liquors. 8. It would be beneficial to suppress altogether the spirit ration. 9. It would be beneficial to permit only beer, tea, coffee, lemonade, &c. to be sold to the troops. 10. I would recommend the substitution of malt liquor for spirits. 11. No spirits are allowed on any account to be issued at the canteen before the dinner hour; no man is allowed more than two drams per diem, and these two drams are never to be issued at the same time. The maximum issue of malt liquor to any one man is three quarts per diem without spirits, or two quarts with one dram of spirits, or one quart with both drams. The liquor contractor in the bazaar is compelled to keep up a preventive police in the bazaar and cantonment to prevent liquor being sold to European soldiers, but soldiers will contrive to obtain spirits in spite of every precaution.
VI. DIET.	1. The composition of the ration for British troops is,—1 lb. of bread, 1 lb. of meat, 4 oz. rice, 2½ oz. sugar, $\frac{5}{7}$ oz. of tea, 1 oz. salt, 1 lb. vegetables, 3 lbs. firewood. Mutton is usually issued twice a week and beef five times. The quartermaster, orderly officer, and the quartermaster-serjeant inspect the rations daily. 2. A complete ration with vegetables is provided, but does not include fruit. No stoppage appears in the mess accounts for the above, but its value is estimated at 5*d.* The soldier has three meals daily, viz., breakfast, consisting of bread and tea, at 7 a.m.; dinner, consisting of bread, meat, and vegetables, at 1 p.m.; and tea, consisting of bread and tea, at 4 p.m. The proportion of vegetables is 1 lb. when procurable; at present they are scarce, and a half a pound is issued with a half a pound of flour. 3. During the cold weather, when vegetables are procurable, the rations are all that could be desired, and being cooked in messes, the soldier could not dispose of any part of them without detection. 4. The Commissariat supply copper kettles and saucepans for cooking, and the men pay for their cooks eight annas per mensem. There are two master cooks, two assistants, and four boys per company. The kitchens being temporary are indifferent. Water is sufficiently supplied. The food is cooked according to the wish of the men of the mess. It is properly done, and tea and coffee are to be had at coffee shops in the lines, of which the men avail themselves. They are seldom able to procure refreshment before a march.

References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	5. Water is not sufficiently abundant for the cultivation of gardens, except in low situations at a distance from the barracks. If there were gardens the men would work in them themselves, and if necessary might subscribe a small sum monthly for seeds, &c. A small allowance from the canteen fund would cover all expenses after the garden had been established.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of cloth tunics, woollen trousers, and forage cap; shoulder and waist belt, two pouches, knapsack, havresack, and water bottle; serge frock, khakee clothing and wicker helmet, ammunition boots, great coats, &c. I consider the dress suitable to the climate. During the rains and cold weather woollen clothing is worn, and khakee during the hot weather. European soldiers are never exposed in cantonments to the sun or rain.
Duties.	1. The men should be thoroughly drilled at home or in a more temperate climate than that of India. 2. The usual routine is one hour's drill daily at sunrise, except on the garrison holiday, Saturdays and Sundays. Occasional evening parades, with drill in the cool weather. The above does not appear to be injurious to the health of the men. The best hour for drill is at sunrise, and for marches, during the night and early morning. There are general orders respecting these. The men have on an average seven nights in bed. 3. Guards mount as far as half a mile from barracks; they usually last 24 hours. Rolls are called at morning parade, breakfast, dinner, tea, and tattoo. The barrack rooms are also visited during the night by the orderly serjeant to see if the beds are occupied. Night guards are not injurious when they do not come oftener than once a week.
VIII. Instruction and Recreation.	1. There is a ball court in the R.H.A. lines. Each corps has a skittle ground, but only the R.H.A. one is built by Government. There is a school, but the schoolmaster of the Bombay Artillery is untrained. There is a library and reading room, but the 3rd Dragoon Guards is the only corps which has the reading room well lighted at night. There are no day rooms, clubs, or gardens. There are regimental artificers, but no regular established workshops, except in mounted corps. There is a station theatre, but no gymnasia. There is not sufficient employment to keep the men occupied in wet weather or during the heat of the day. They are not allowed to go out in the heat of the day, and are generally healthy. 2. I would recommend that there should be ball alleys to all the barracks, with covered skittle alleys. Reading rooms well supplied with newspapers and lighted at nights. 3. The present system of savings' banks answers well. 4. The space in the verandah is insufficient for exercise, and there are no trees near the barracks.
IX. Military Prisons.	1. The military prisons in the cantonment are temporary buildings. Cells properly ventilated are to be constructed; those at present in use are not well ventilated, and are ill adapted for the purpose.
X. Field Service.	1. There are no local regulations of any consequence in regard to field medical service. 2. The medical officer has the power of objecting in regard to the line of march, camping, billeting, &c. 3. In the late campaign rules were proposed for the preservation of the health of the troops in camp by the principal medical officer, and sanctioned and published for general information by the general officer in command. 4. The orders relative to field hospitals are bad. For the transport of sick and of hospital supplies they are excellent. Copies of all regulations bearing on these matters will probably be furnished by the director-general.
XI. Statistics of Disease and Mortality.	1. The following Table gives the sickness and mortality of British and Native troops:—

MHQW.

European Troops.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1857–58	Detachment H.M. 14th Light Dragoons. Detachment H.M. 86th Regiment	148	59	—	—	—	16	—	14	1	42	—	2	—	21	8	94	1	248	10	167·5	6·7
1858–59	7–11 Royal Artillery Detachment H.M. 17th Lancers H.M. 71st Highlanders H.M. 72nd do. H.M. 92nd do. H.M. Depôt	900	826	2	2	—	76	2	46	5	281	10	16	2	1	—	808	1	2,056	22	228·4	2·4
	European Troops in the Indian Army.																					
1857–58	1st Troop Horse Brigade 4th Company 2nd Battalion Artillery Detachment 3rd European Regiment	38	9	—	—	—	3	—	1	—	16	—	1	—	—	—	38	—	68	—	178·9	—
	Native Troops.																					
1857–58	Gun Lascars, 4th Company, 2nd Battalion Artillery. Detachment Sappers and Miners 25th Regiment Native Infantry	207	64	—	—	—	2	—	—	—	32	—	1	—	6	3	75	—	180	3	86·9	1·4
1858–59	3rd Regiment Light Cavalry Detachment Southern Mahratta Irregular Horse. 4th Company 4th Battalion Artillery 4th Regiment Native Infantry 19th do. do. 23rd do. do. Native details	1,792	1,158	9	36	—	68	5	16	2	253	4	16	—	—	—	1237	6	2,784	26	155·3	1·4

By order of the Acting Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department,
Bombay, 27th July 186(

W. C. Coles, Assistant-Surgeon,
Secretary.

MHOW. BOMBAY.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1. The building used as a hospital by the 72nd Highlanders was formerly used for native soldiers, and the hospital of the 3rd Dragoons was formerly an officer's dwelling house. They will both be abandoned as soon as proper hospital accommodation can be provided. To give any detailed description of them would be therefore superfluous. They are about 100 paces to leeward of the barracks and stables, and about 300 yards from the bazaar. The site is tolerably open, but is low and indifferently drained, though at a good distance from any river or nullah. 3. The water supply is abundant. 4. Refuse water is carried off by surface drains. 5. The wards are scarcely at all raised from the ground in one hospital, and in the other about two feet, but there is no perflation of air underneath the floors. The roof water runs into the surface drains. There are open drains, which are sufficient to carry away the rainfall. The walls of the hospitals are of sun-dried bricks and mud. The roofs are thatched. Both being thick, the hospitals are tolerably cool. They have verandahs about 10 feet wide, which afford sufficient shelter. The verandahs are sometimes used for the accommodation of sick, but never when it can be avoided. The hospital consists of one flat. The date of construction is unknown. There are 2 wards, and the number of beds is uncertain. The hospital is not judiciously placed. The windows open inwardly, and when open permit free ventilation. 6. They are ventilated by opening the doors and windows. One building has cowls in the roof. There are no jalousies or jhilmils. 7. There are no punkahs, but kuskus tatties are used in the hot season. 8. No means of warming are required. The walls and ceilings are limewashed every three months. 9. The privies and urinals are at one end of the buildings, running to leeward. Deodorizing agents and effective sweeping prevent their being offensive. 10. The lavatory arrangements answer the purpose, but are all of a temporary description. 11. The means of bathing is by tubs, and is sufficient. 12. The linen is washed by washermen at a distance from the hospitals. 13. The storage is dry and sufficient, but all is temporary. 14. The bedsteads are iron, the mattresses stuffed with rice straw; sheets and blankets are provided, and are all good. 15. The kitchen is conveniently situated, but temporary, like the rest. The cooking apparatus is sufficient; the diets are well cooked, and can be sufficiently varied. 16. Diet tables, &c. will most likely be furnished by the Director-General. 17. For attendance on the sick there is a hospital serjeant and ward boys, who make excellent nurses. 18. The hospital is healthy, and no epidemic diseases, gangrene, or pyœmia have had their origin in it. 19. I have already mentioned the improvements required. 20. In such hospitals as these no arrangements could be made for convalescents taking exercise. There are no suitable fenced nor shaded walks and no seats. 21. The sick wives and children of soldiers are always treated in female hospitals, but here there are none. As neither the dragoons nor Highland regiments have their families with them, the want is little felt. 22. There are no special local hospital regulations worth sending. 23. In regard to repairs, alterations, and improvements, the medical officer can only recommend. In regard to diets and medical comforts, nobody but his professional superior can interfere in the field or in camp. 24. Convalescents are kept in hospital till fit for duty, but not in separate wards.
XIII. Burial of the Dead.	1. The burial ground for British troops is within the cantonment limits, but situated on the S.E. side of camp, to leeward of the prevailing winds. 2. Its area is 17,100 yards laid *morum*, subsoil decayed trap; it is situated on sloping ground, and the drainage good. Decomposition does not take place readily, as the soil is impregnated with lime. 3. The grave space allowed is what is necessary, so that no ground be wasted. Two feet is the interval between the graves. The depth depends on the soil; 4½ feet deep is the average. Graves are never reopened, and only one interment takes place in each. Early decomposition prevents the body being kept longer than from 24 to 30 hours. On one occasion during an epidemic, funeral parties attended twice a day at hospital, and took away all bodies they found in the dead house. Native dead are soon removed. 4. The graveyard has not been observed to be offensive. Funerals take place at sunrise and sunset. If notice be received before 3 p.m., the funeral takes place in the evening; if after that time, in the morning. 5. The dead of camp followers and bazaar people are buried and burnt. 6, 7. The present practice is the best that can be pursued, and I have no improvements to suggest.

(Signed) R. W. Honner, Brigadier, commanding Malwa Division.
F. S. Arnott, M.D., Superintending Surgeon, M.D.A.
G. J. Melliss, Lieut. Executive Engineer, M.D.

SATTARA.

Accommodation
- European Troops
  - Artillery - 88
  - Cavalry - 352
  - Infantry - 200
- Native Troops
  - Artillery - No accommodation.
  - Cavalry - Ditto.
  - Infantry - 1,000

References to Subjects and Queries.	Replies.
I. Topography.	1. The station is in a valley, the surrounding hills bare at their summits and bases, lightly and partially wooded on their slopes. It is intersected by two rivers, well cultivated (crops light) and moderately wooded. It has a general slope from the base of the hills, where the soil (the débris of decomposed rock) is dry and poor. In the flat part of the valley and near the river there is black soil, but no swamp. There are trees scattered or in clumps and single, but no jungle. Besides the water of the rivers, there are a few small tanks and nullahs here and there dammed for irrigation (which is very limited). 2. The elevation of the station above the sea is 2,320 feet. The general valley level is about the same, the surrounding hills varying from 600 to 1,500 feet higher. The nearest notable amount of water is that of the river, distant a mile at the nearest point. There is a nullah running through, and another forming a boundary of the camp, but both are dry in the hot weather. There is somewhat higher ground a little beyond the camp, to be preferred to any other as a site for barracks in my opinion. 3. The fort hill is distant about 1½ miles from the station. It is 1,000 feet high, with an area on the top of about one-eighth of a square mile. Utishwur, a spur of the Mahableshwur range, is 1,500 feet high. 4. A nullah runs through camp, dry in the hot weather, and the river is within a mile. Inundation is unknown. There are no ravines or broken ground which can be considered prejudicial to health. 5. The station is quite open, the hills being too distant to obstruct ventilation. The temperature of the station is not raised by reflected sun heat: but the barracks are hot, being temporary and kutcha. The station is subject to land winds (E. and N.E.) and to the sea breeze (W.S.W.), the latter modified by distance from the ocean; both prevail with tolerable regularity, according to the season and time of day, and neither seem to exert any marked influence on health generally, but the former prevailing at night is sometimes charged with a small amount of marsh poison from the river, as has been lately evidenced. 6. The surrounding country is cultivated. There are no works of irrigation near the station worthy of note, and garden irrigation only very near the camp. Irrigation in its present extent is not believed to have any effect on the health of the station. There is no rice cultivation, and neither indigo, hemp, nor flax are grown in the district. 7. The city of Sattara, with a population of 30,000, is within 2 miles. 8. The whole of the district is of "trap" formation, the sides of the hills presenting many parallel and horizontal layers of basalt and amygdaloid, capped here and there with laterite. The station is situated on the hard swelling flank of one of the hill ranges, and occupies new ground. 9. In the dry season water is usually found at a depth of from 15 to 45 feet, and in the rainy season at from 5 to 10 feet. 10. The surface water flows readily away: the slope is great and the soil hard. There is no drainage from higher ground passing into the subsoil of the station. There is no water bearing subsoil. 11. The water supply of the station is derived principally from wells, but there are two or three small tanks, which, as well as the wells, are all in rock. The extent of tank surface is 29,165 square yards, or about 6 acres. The tanks are filled during the rains, and fall low towards the hot weather, and are then nearly, if not quite, dry. There are a few aquatic plants in the tanks not requiring botanical description, and the only animal to be noted is the guinea worm. No tank used for drinking purposes is used also for bathing, nor are the wells in general use rendered impure by decaying vegetable matter or surface drainage. No nuisance or malaria proceeds from any tanks within or without the station. 12. The water supply consists of about 15 wells and 3 tanks, and the nullah running through camp, which affords water for bathing 8 months in the year. In most of the wells the water is colourless, somewhat hard and inodorous. Its chemical composition or microscopic character have not been ascertained. As a rule, it is rather hard, though soft in the monsoon, good enough not to be injurious to health, and sufficiently abundant in most years. It is raised by means of buckets and ropes. The quantity and quality of the supply could be improved by bringing water from a large reservoir on the neighbouring range of hills, and surveys for a project having this end in view are already half complete, but their further prosecution is delayed for the present, owing to the suspension of public works. 13. A malarious fever has prevailed this hot season, the marsh poison cause of which could only have proceeded from the river. This is the most important if not the only influence bearing on the health of Europeans at this station to be considered. 14. I do not know the kind of data, or by whom collected, on which are founded the establishment of new stations. I think, however, that common sense and local experience, as well as scientific knowledge, should be made available on these medico-military occasions.

SATTARA.
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References to Subjects and Queries.	REPLIES.
II. CLIMATE.	1. The means available for conducting meteorological observations at the station are the common thermometer, rain gauge, and weather-cock in the cantonment, and in addition to these a hygrometer and barometer in the civil hospital. 2. The following table contains the observations :— Years of Observation from 1855 to 1859 (4 years).

Months.	Barometer Mean.	Mean Daily Temp.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain.	Winds.		Days of Sunshine.
									Direction.	Force.	
	Inches.	°	°	°		°	°	Inches.			
January	27·874	70·4	81·	62·7	—	64·3	107·6	·6	S.W. & S.E.	—	—
February	27·849	74·7	81·5	66·5	—	67·4	108·8	None.	S.W. & E.	—	—
March	27·825	78·1	85·2	71·5	—	68·02	106·	·08	S.W. & E.	—	—
April	27·763	81·4	88·4	74·8	—	68·9	112·	·95	S.W.	—	—
May	27·716	80·6	85·	73·8	—	72·3	95·4	3·34	S. & S.W.	—	—
June	27·639	76·2	79·8	73·2	—	72·3	83·4	5·04	S. & S.W.	—	—
July	27·631	75·5	75·2	71·2	—	71·02	75·4	13·06	S.W. & W.	—	—
August	27·685	73·02	74·7	70·7	—	70·5	—	7·08	S.W. & W.	—	—
September	27·729	74·05	77·2	70·7	—	71·02	82·8	3·08	S.W. & W.	—	—
October	27·796	74·5	75·	69·2	—	69·7	82·8	4·65	S.W. & S.E.	—	—
November	27·856	73·9	79·7	65·	—	67·3	101·4	·57	S.W. & W.	—	—
December	27·866	70·9	79·	61·7	—	64·7	103·6	·59	S.W & W.	—	—

The above is filled in from the records of the civil hospital, which afford a more extended period of observation (including that of the barometer) than those of any hospital in camp. I think they must not be valued beyond an "approximation," but an extract of observations under Surgeon Murray, quite trustworthy, is appended. See opposite page.

3. The climate, generally considered, is good for three months. The air is hot and dry, but not very exhausting. In the rains, it is fresh, not damp or chilly, and the temperature very equable. The cold in the winter months is not invigorating. I think there are no influences (except the river in some years) prejudicial to health. The station is proved to be healthy for natives, and with good and well-placed barracks, would be no less so for Europeans. Light early morning drill is desirable in the hot weather. As to diet, clothing, &c., there is nothing special required by the climate.

From June to December, comprising the rains and the beginning of cold weather, is the unhealthy season for natives, when fever, bowel complaints, and rheumatism prevail. October, with the hot months of March, April, and May, are unhealthy for Europeans, when they suffer from fever principally of a mild type.

4. There is no district on the same level as the station more conducive to health, and the hill sites, adverted to under Topography, are not habitable all the year round.

5. The stations on which I have served are the following :—Bombay, Shikapore, Sukkur, and Hyderabad (in Sinde), Surat and Deesa (in Guzerat), Sattara (in the Deccan). Of these stations, according to my experience, Deesa is the healthiest.

III. SANITARY CONDITION OF STATION.

1, 2, and 3, maps and plans.

4. The following table gives the accommodation in the barracks :—

Date of construction of barracks, January to July 1858.

Total number of rooms, 13.

Total regulation number of non-commissioned officers and men, 520.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
				To wall plate.	Including vacuity of roof.			About		Feet.	Feet.
13	40	100	20	10	29,000	735	50	2 feet.	18	4½	3
Guard Room	1	25	12	10	3,900	557	43	2 „	6	4½	3
Prison Cell	1	8	6½	10	676	676	52	2 „	1	2¾	2½

5. The windows are on opposite sides, and open as casements. There is a five feet verandah on both sides, and at the ends also. The verandah is never occupied as sleeping quarters. There are no jalousies or jhilmils.

6. The bedsteads for hospital patients are of iron. For the barracks, iron trestles with wooden boards. No bedsteads are used in tents. I have no improvements to suggest.

7. The tents used in camp are bell-shaped, with double flys. They are 14 feet 6 inches by 14 feet. The number of men, 13; superficial area per man 15.7.4; cubic space per man, 123. 7. 5. Double poled tents, with double flys, are 22·6 feet by 14 feet 6 inches, to contain 22 men. Superficial area per man 14. 9. 11; cubic space per man, 124.

8. There is no appliance in the barracks for ventilation, which is not sufficient unless the windows are opened. No means are used for cooling the air.

9. The barracks have wattle and dab walls, and grass thatches, and are of a merely temporary construction. Tents are made of cotton cloth.

10. Floors are constructed of beaten earth. They are raised from one to five feet above the ground, according to the slope of the surface, and there is no passage of air beneath.

A Synopsis of Four Years' Meteorological Observations (from 1st January 1844 to 31st December 1847), at Sattara.

Latitude 17° 40′ N., Longitude 74° 2′ E. Height above the sea, 2,320 feet.

Months.	In-door Temperature.									Out-door Temperature in the Shade.									Humidity of the Air.	Rain Fall.						Winds.	
	Means.					Extremes.				Means.					Extremes.					Means.				Extremes.			
	Mean Temperature.	Mean Daily Variation.	Mean Daily Maximum.	Mean Daily Minimum.	Difference of Mean Temperature of successive Months.	Extreme Daily Range.	Extreme Monthly Range.	Extreme Maximum.	Extreme Minimum.	Mean Temperature.	Mean Daily Variation.	Mean Daily Maximum.	Mean Daily Minimum.	Difference of Mean Temperature in successive Months.	Extreme Daily Range.	Extreme Monthly Range.	Extreme Maximum.	Extreme Minimum.		Mean Monthly Fall.	Mean Number of Rainy Days.	Mean Day Fall.	Mean Night Fall.	Extreme Daily Fall.	Extreme Monthly Fall.	Direction.	Force.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	Inches.		Inches.	Inches.	Inches.	Inches.		
January	70·0	8·7	76·4	67·7	—	12·5	18·0	80·5	59·5	73·4	17·4	82·1	64·7	—	23·0	31·0	86·0	53·0	8·5	0·01	1 in 2 years.	—	0·01	0·03	0·03	E., S.W.	Modte.
February	72·6	8·0	76·6	68·6	1·6	11·0	20·0	80·0	58·5	73·2	18·2	82·3	64·1	0·2	26·0	33·0	90·0	50·5	9·3	0·08	3 in 4 years.	0·08	—	0·18	0·18	E., W.	Fresh
March	77·8	6·8	81·2	74·4	5·2	10·5	15·5	85·5	68·5	81·5	20·5	91·8	71·3	8·3	52·0	38·5	100·5	62·0	10·2	0·04	3 in 4 years.	0·01	0·03	0·07	0·18	E., S.W.	Modte.
April	80·6	8·2	84·7	76·5	2·8	11·8	17·7	90·7	68·0	85·1	20·7	95·5	74·8	3·6	31·5	36·5	102·5	64·0	10·5	2·97	2	1·54	1·43	4·40	10·88	E., W., S.W.	„
May	80·1	8·6	84·4	75·8	0·5	11·0	14·0	87·7	71·0	85·5	19·0	95·0	76·0	0·4	26·0	29·5	103·5	70·0	8·2	1·26	4	1·17	0·09	1·55	3·49	„	„
June	77·8	4·6	79·3	74·7	3·1	11·3	15·5	86·0	70·5	75·9	7·6	79·7	72·1	9·6	22·0	22·0	93·0	69·0	4·5	7·53	20	4·66	2·87	2·09	10·39	E., W., S.W.	„
July	73·8	3·1	75·4	72·3	3·2	7·3	10·0	82·0	70·0	73·6	4·6	75·9	71·3	2·3	7·5	11·0	91·0	60·0	3·5	10·44	24	5·18	5·26	3·41	16·04	W., S.W.	Fresh
August	73·0	3·2	74·6	71·4	0·8	6·0	7·5	78·5	69·5	72·7	3·2	74·3	71·1	0·9	10·0	10·0	80·0	69·0	3·7	3·28	24	2·21	3·07	1·81	11·91	W.	„
September	74·0	4·7	74·4	71·7	1·0	8·5	11·0	81·5	69·0	73·8	7·8	77·7	69·9	1·1	16·0	19·0	83·0	64·0	4·2	4·54	12	3·41	1·13	3·55	9·71	„	Light
October	76·1	5·4	78·8	73·4	2·1	9·0	13·0	82·5	69·0	76·6	12·4	82·8	70·4	2·8	21·0	30·0	93·0	63·0	6·1	3·65	6	1·10	2·52	3·25	5·25	„	„
November	72·0	7·0	75·5	68·5	4·1	13·0	19·0	81·0	60·0	70·9	14·0	77·9	63·9	5·7	21·0	25·0	85·0	58·0	7·6	2·74	2	0·33	2·41	4·61	8·00	E.	Modte.
December	71·8	7·2	75·4	68·2	0·2	11·0	17·3	80·0	61·0	71·2	16·7	79·6	62·9	0·3	25·0	27·0	86·0	57·0	8·1	0·66	1	0·36	0·30	1·72	2·46	E., S.	„
Quadrennial Mean and Extremes	75·0	6·3	78·2	71·9	2·2	13·0	20·0	90·7	58·5	76·0	13·5	82·8	69·3	3·1	32·0	68·5	103·5	50·5	7·0	39·20	97	20·07	19·13	4·61	11·91	—	—

This gives the rain-fall in the city; the average annual fall in camp, distant 1½ miles, is from 6–7 inches *less*.

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	11. The European barracks being temporary, are of course defective in all respects. The huts of the native lines are good enough. Barracks and cantonments are kept in repair by the engineer department, and are quickly executed. The commanding officer is responsible. There is no specific period for cleansing and lime-washing, which are performed, when needed, at intervals of from four to six months. 12. There are no baths. 13. The cooking is conducted by the soldiers' servants on wood fires. Water is brought by bheesties. Linen is washed and dried by dhobies (washermen). 14. The urinals and privies are not drained. They are cleansed in the manner usual in India, by a class of men called bhungies or sweepers. 15. The ventilation is spontaneous by the doors and windows. The barracks are lighted at night by oil lamps. 16. There are no sewers. The surface drainage is readily and efficiently carried off by open trenches. No part of the barracks or hospitals is known to be damp. There is no stagnant drainage. There are no cesspits. One nullah on the east side of the camp is occasionally offensive for short periods. 17. The system of surface cleansing (lately improved) is good. It is performed daily, and the refuse manure, &c., carried to a safe distance from and to leeward of camp. 18. The surface of the cantonment is kept perfectly free from vegetation. There are no old walls or hedges interfering with ventilation. 19. The sanitary condition of the bazaar is in every point good. A sufficient number of sweepers are employed, and a cart to carry away refuse, &c. No improvement has to be suggested at this station. There are no native houses near enough to require description. No nuisance is experienced from wind blowing over native dwellings. 20. Animals are slaughtered near a watercourse (nullah) to the eastward of cantonments. There are no regulations in force further than that they are obliged to be to leeward of camp. The offal is removed daily, and no nuisance is experienced from the slaughtering places. 21. There are no bazaar stables. The few tattoes in the bazaar are picketed in an open space in rear of the bazaar, and the manure is carted away daily. 22. There are no artillery or cavalry stables. The horses are picketed in double lines. The cavalry horse lines are distant about 100 yards from the men's quarters in a south-westerly direction. The artillery horse lines are distant from the men's quarters 60 yards, in an easterly direction. The dung is deposited in a nullah in rear of the barrack, at a spot which is 200 yards distant from the nearest barracks, and 600 yards from the hospital. 23. There is separate accommodation for the married non-commissioned officers and privates, and they do not occupy the barrack rooms with the men.
Officers' Quarters.	1. The sanitary condition of the officers' quarters (which are separate houses) is good. No general recommendation would apply to dwellings no two of which are alike.
IV. HEALTH OF THE TROOPS.	1. The district in which the station is situated is healthy. 2. The diseases most prevalent among the native population are fevers (chiefly mild intermittent), sub-acute rheumatism, and guinea worm. Spleen disease is rare; cholera prevails in some seasons. 3. I attribute the healthiness of the native population chiefly to the elevation of the district and the scanty vegetation of a somewhat poor soil. 4. Before coming to this station, the European troops were at Ahmednuggur. Their stay was 2 years and 11 months, and they left on the 12th July 1857. Their general health there was good. There is no record of the prevalent diseases. They arrived here healthy on the 25th July 1857, since which intermittent fever of a mild type is the disease they have chiefly suffered from. The native regiment had been at Baroda 3 years and 3 months, and left by wings on the 31st March and 25th April 1859. Their general health there was bad. The prevailing diseases, fever and rheumatism. They arrived here in an unhealthy state on the 27th April and 31st May. The men have suffered here from fever and rheumatism in the sub-acute or chronic form. The barracks (temporary as they all are at this station) occupied by the artillery stand on a low site, and are therefore nearer and more exposed to the malaria of the river. 5. The troops have never been camped out. 6. I have never been in charge of troops at a hill station. 7. My experience scarcely justifies an opinion in regard to the health of troops at hill stations. I once sent a few men from a troop of horse artillery to Mount Aboo, in whom little tendency to relapse was shown on their return. 8. I approve of selecting hill stations for troops. 9. I have no experience as to diseases peculiar to hill stations, but men there would doubtless be subject to capillary congestive forms of disease of both kinds (æsthenic in old soldiers with enfeebled organs). Dysentery and diarrhœa are said to prevail. 10. At hill stations, I should give diet according to the increased assimilating power, holding inflammatory tendency in view; and warm clothing, especially a flannel belt over the belly or any weak organ, with protection from the night air, avoidance of wet feet, and exercise strong enough to excite perspiration in the strong and increase action in the weak. 11. I have no experience, but am of opinion that the hot months are best adapted for the hill stations, to avoid cholera and exhaustion; September and October should be selected to avoid malaria. With my avowed inexperience, I could not define the time necessary for troops to obtain the full benefit of a hill station. 12. I think any period beyond the acquirement of moderate tonicity would be injurious. This period would apply differently to young and old soldiers. 13. The special precautions for protecting health on leaving hill-stations are avoidance of sun, and all stimulating influences, diminished food, lighter clothing. 14. Long periods of residence on the hills, and short on the plains, would in my opinion most conduce to the health of the troops. Moderately frequent change of station in the plains is beneficial, and before intolerance of the climate contemplated in the transfer has been acquired (as from Guzerat and the coast to the Deccan). 15. Mount Aboo and Poorrendhur are the only hill stations with which I am acquainted, and in these the barrack accommodation is limited. 16. I have an opinion in regard to the level most suitable for hill stations, but no experience. 17. There is higher ground near this station at Utishwur, four miles to its summit from the station, accessible by a good enough road for beasts, but not carts. Its height is 1,500 feet

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	above the plain, with a climate described by occasional residents to be good; but I think the rain-fall is too great for residence in the monsoon. 18. I have found light surface and porous subsoils most healthy; black soil, as containing vegetable matter decomposing under heat and moisture, excepted. 19. I consider from 20 to 25 the best age for soldiers proceeding to India, and the best time of landing the beginning of the cold weather. I have no knowledge how troops are disposed of on landing, beyond a general one that the barracks at Bombay, into which most of the troops are at first received, are all bad, either in site or construction. I should recommend that troops should be sent straight to a plateau or hill station of moderate elevation. 20. If the Cape, Australia, or the Mauritius are the intermediate stations referred to for troops proceeding to India, they might be sent there now, but not, I think, when hill stations are organized. I should advise their being sent to hill districts on landing. 21. In Bombay, the mode of transporting troops to the interior is chiefly by land marching. The first great precaution is the selection of a proper season; the next to keep the men from liquor. 22. I consider about 15 years as the length of time for a soldier to serve in India. Longer, if the hill sanitaria plan is carried out. 23. In my own experience I have found no conflict of opinion on the subject of invaliding. If, however, opinion is invited as to other boards, I am strongly against them for passing recruits, and think that at least the final power of rejection should be vested in the regimental surgeon. 24. Invalids should leave India so as to arrive at home in early summer.
Diseases.	1. There are regular inspection parades of European soldiers for the discovery of incipient disease ordinarily once a week. 2. There has never been scorbutic disease amongst the European troops, and only an occasional case of taint amongst the present natives of the brigade. 3. The ratio of cases of hepatic disease to all others has been only 1·03 per cent. for three years. 4. The primary cases of dracunculus (that is not brought here) amongst the Europeans under observation have only been 0·62 per cent. on all others. Amongst the native troops it has been more common, and avoidance of the tanks and wells known to produce it is the only preventive I know of, and this cannot be carried out with the natives to any useful extent. 5. On a three years' estimate, venereal cases amongst the Europeans have borne a ratio only of 8·22 per cent. to all others, and no precautionary suggestions have to be offered as to this station. 6. As regards epidemic diseases, both European and native troops are most subject to fevers, chiefly mild quotidian intermittents. Dysentery is so rare as hardly to be called an endemic disease. The troops, European especially, suffer little from it. Cholera and small-pox prevail amongst the population most years; the troops are protected by prophylactic care and vaccination; they suffer little. The native troops suffer much from rheumatism, the Europeans scarcely at all. In the European battery, average strength 74 (the only detail susceptible of correct observation), there have been two deaths only, one from dysentery, and one from cholera; the ratios therefore would be of no practical use. 7. Very few zymotic diseases have come under my observation at this station; their invasion might be expected at the beginning and end of the rains. Cholera and small-pox generally prevail in the hot weather, when the air is hot and moist; in the station bazaar and native lines this class of diseases may be looked for. The former is small, and stands on a slope; the houses are not crowded, and no organic remains are allowed to accumulate. The lines are open; in both the best sanitary means available are in force. The troops and natives are for the most part cleanly in their persons, but the latter are opposed to ventilation in their dwellings. 8. Some of the soldier's duties and occupations favour epidemic disease, but there are no personal habits conducing thereto which cannot, I think, be controlled. 9. Doses of quinine as a prophylactic have been tried at the station to a small extent; I tried them some years ago on the malarial banks of the Indus without much effect. 10. The only morbific cause to be guarded against at this station is marsh poison, chiefly from the river. It is small in quantity, but brought by the night wind on the soldier at the susceptible time of sleep, producing fever, as has been evidenced this hot weather. This applies to the Europeans only, and might, in my opinion, be obviated by good barracks.
V. Intemperance.	1. The soldiers at the station to whom observation has been extended are temperate; there are no confirmed drunkards. 2. Admissions to hospital from drunkenness and its sequelæ have been so very rare that a scale of proportion would be too small for statistical usefulness. Drunkenness is punished as an offence. 3. Rum or arrack received from the commissariat on indent is sold to the soldier only at the canteen. Bazaar shopkeepers are prohibited from selling liquor to soldiers. Spirits are procured from Government of the first quality, and issued to the troops on payment, diluted with one-fourth of water. The quantity varies in different regiments and seasons, usually it is about a dram a day to each man. Spirits form no part of the ration of the soldier. It is never or very rarely indeed given to convalescents. No other drinks are sold at the bazaar or canteen injurious to health; fresh toddy is not obtainable. 4. The consumption of spirits is injurious to the health of troops and convalescents; it is neither conducive to health nor to the efficiency and discipline of the corps. 5. I think it would certainly be beneficial here to abolish the use of spirituous liquors. 6. I consider malt liquor and wines less injurious than spirits. 7. Coffee, tea, lemonade, and similar drinks are used at the station to a considerable extent; I consider that as a rule they are preferable. Malt liquor is *sometimes* necessary. 8. It would be highly beneficial to suppress the use of spirits altogether. 9. It would be beneficial to restrict the canteen supplies to malt liquor, porter, &c. 10. I would recommend that in restricting the sale of spirits in the canteen, the most rigid means be adopted to prevent the purchase of them in the bazaar, &c. 11. There are no local canteen and bazaar regulations; they are laid down in Jameson's Code and its appendices, and are strictly enforced and implicitly obeyed.

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References to Subjects and Queries.	Replies.
VI. Diet.	1. The composition of the ration for Queen's British troops and Europeans in the Indian army is of meat, bread, vegetables, and groceries; 1 lb. meat, 1 lb. bread, 1 lb. vegetables, $\frac{5}{7}$ oz. of tea, $1\frac{2}{7}$ oz. of sugar, 4 oz. rice, 1 oz. salt; mutton twice a week. The rations are inspected by the quartermaster serjeants of detachments, and subsequently by the orderly officer, after having been passed by the commissariat inspector in the first instance, when submitted by the contractors. 2. A complete ration (except fruit) is provided, and the stoppage is 3 annas 4 pice per diem. 3 meals a day; breakfast at 7 a.m., dinner at 1 p.m., and supper at 7 p.m. The proportion of vegetables in the ration is 1 lb. to each man. 3. The diet scale, when practicable, might be more varied, as in fact it is at this station by the issue of mutton. There is no arrangement to prevent the troops disposing of any part of the ration; such a thing is not known. 4. Cook-rooms are attached to each barrack; they are separate buildings, and the rations are cooked in copper utensils, which are tinned monthly. The kitchens are clean and good, considering their temporary construction. Water is supplied by bheesties. The food is boiled, there being no appliances for roasting; the cooking is not sufficiently varied. Tea and coffee are properly prepared. Troops usually commence the march about 2 or 3 a.m., and are supplied with coffee half way, but have no refreshment before starting. 5. Gardens for the cultivation of vegetables by the soldiers might decidedly be established at this station with advantage; they should be on the self-supporting plan.
VII. Dress, Accoutrements, and Duties.	1. A soldier's dress consists of a tunic and shell jacket, black cloth trousers, and forage cap during the monsoon and cold weather. Khakee clothing and red serge coat, with wicker helmet and blue serge trousers, in the hot season. The accoutrements consist of a shoulder belt, waist belt, pouches, and bayonet scabbard; I consider the present dress suitable to the climate. The helmet might be made lighter; the guard dress is according to the season of the year. There are verandahs and sun-boards as a protection from the sun, and verandahs and sentry-boxes as a protection from rain.
Duties.	1. It would be advisable for the men to be thoroughly drilled at home before being sent to India. 2. They have parade in the morning for one hour with arms, in the evening one hour without arms, for four days in the week; fatigue duties and guards. The men do not suffer from drill; the best hour for drill is the early morning. There are no general orders on the subject. They have, on an average, five nights in bed during the week. 3. Guards are mounted at about one mile from barracks at the most distant guard; they are relieved every 24 hours. There are three roll calls by day and one by night; night guards are not prejudicial to health at this station, and no further precautions are required.
VIII. Instruction and Recreation.	1. There are no ball courts, skittle grounds, library nor reading room; no gardens, workshops, nor gymnasia. There is one school in the artillery, and a theatre (barrack-room). These are certainly not sufficient to keep the men occupied during the wet season or heat of the day. The men are restricted from exposing themselves to the sun during the heat of the day, and other restrictions are imposed which are conducive to health. 2. I should recommend the men having full amusement and occupation, such as ball courts, skittle grounds, school, library, day rooms, gardens, workshops, gymnasia. 3. Savings' banks have been already instituted with advantage. 4. There is *not* sufficient shade from trees or otherwise to enable the men to take exercise without injury during the day.
IX. Military Prisons.	1. The cells, like the barracks, being temporary, are defective.
X. Field Service.	1. There are no local regulations for field medical service. 2. As in all mixed medical and military consultations, the power of the surgeon is limited to recommending; this is enough where the commanding officer and himself, as is usually the case, are *en rapport;* if not, I apprehend there is an appeal open. 3. The practical operation of measures for the preservation of the soldier's health in camp I leave to be disposed of by men of more recent experience in the field.
XI. Statistics of Sickness and Mortality.	The following form shows the statistics:—

SATTARA.—European Troops.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1857-58	Detachment H.M.'s 14th Light Dragoons.	132	33	—	3	1	7	—	7	—	14	1	3	—	—	—	82	—	148	2	112·1	1·5
	Do. do. 3rd Dragoons																					
	Do. do. 33rd Regiment																					
1858-59	Do. do. 3rd Dragoons	346	208	1	1	—	16	—	10	—	48	2	16	2	—	—	230	—	529	5	152·8	1·4
	Do. do. 6th Inniskilling																					
	Do. do. 18th Royal Irish																					
	Do. do. 33rd Regiment																					
1859-60	Do. do. 56th do.	301	319	—	—	—	14	1	5	—	84	—	24	—	18	10	270	—	734	11	243·8	3·6
	Do. do. 6th Inniskilling																					
	Do. do. 31st Regiment																					
	Do. do. 57th do.																					
	Do. do. German Legion																					
	European Troops in the Indian Army.																					
1857-58	4th Troop Horse Brigade	156	38	—		—	4	—	6	—	22	—	5	—	—	—	85	—	161	—	103·2	—
	2nd Company 2nd Battalion Artillery																					
	Detachment 3rd European Regiment																					
1858-59	2nd Company 2nd Battalion Artillery	89	90	—	1	—	6	—	2	—	24	—	4	—	—	—	87	—	214	—	240·4	—
1859-60	Do. do. do do.	82	156	—	—	—	1	—	1	—	17	1	4	—	1	1	34	—	214	2	260·9	2·4

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Disease of the Liver. Treated.	Disease of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1850-51	5th Company 4th Battalion Artillery 18th Regiment Native Infantry 24th do. do.	1,548	283	—	1	—	36	1	4	—	63	1	4	—	—	—	414	—	805	2	52·0	0·1
1851-52	5th Company 4th Battalion Artillery 24th Regiment Native Infantry	776	153	—	2	—	12	—	—	—	58	—	12	—	3	2	207	2	447	4	57·6	0·5
1852-53	5th Company 4th Battalion Artillery 24th Regiment Native Infantry	791	151	1	—	—	15	—	1	—	27	—	17	1	—	—	160	—	371	2	46·9	0·2
1853-54	6th Company 3rd Battalion Artillery 5th Company 4th do. do. 24th Regiment Native Infantry	758	179	—	2	—	11	—	1	1	38	—	3	—	—	—	171	1	405	2	53·4	0·2
1854-55	6th Company 3rd Battalion Artillery 26th Regiment Native Infantry	903	139	2	9	—	11	—	1	—	78	3	8	—	—	—	244	2	490	7	54·2	0·7
1855-56	6th Company 3rd Battalion Artillery 26th Regiment Native Infantry	810	299	—	2	—	18	2	2	—	56	—	5	—	—	—	281	2	663	4	81·8	0·5
1856-57	6th Company 3rd Battalion Artillery 22nd Regiment Native Infantry 26th do. do. do. Detachment 24th do. do.	1,722	392	1	9	1	30	3	4	—	93	—	6	1	—	—	490	—	1,024	6	59·4	0·3
1857-5	6th Company 3rd Battalion Artillery Detachment 1st Regiment Sinde Irregular Horse. Detachment Southern Mahratta Irregular Horse. 22nd Regiment Native Infantry	975	518	3	46	2	15	1	—	—	80	—	6	1	2	1	464	3	1,131	11	116·0	1·1
1858-59	Detachment Southern Mahratta Irregular Horse. 22nd Regiment Native Infantry	708	293	2	14	—	8	—	—	—	43	—	2	—	—	—	366	2	726	4	102·5	0·5
1859-60	Detachment Southern Mahratta Irregular Horse. 8th Regiment Native Infantry	804	387	4	—	—	60	—	1	—	89	3	6	—	8	3	435	—	998	10	124·1	1·2

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, 17th August 1860.

W. C. COLES, Assistant-Surgeon,
Secretary.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. Plan. 2. The hospital is situated on the right front of the men's barracks, 150 yards distant from the nearest, and about 450 yards from the horse lines; it is 900 yards distant from the bazaar, and N.E. of it, and upwards of a mile from the houses of the civil population. The site is open and freely ventilated, and there are no high walls, trees, buildings, &c., anywhere near it. The sites of the present European hospitals are in my opinion objectionable, but, as before observed, they are temporary buildings. 3. The water supply is sufficient and wholesome. 4. All sewage and refuse is cleared away by sweepers. All surface water is carried off by open drains. The hospital is situated on quickly sloping ground. 5. The lowest ward is raised on an average 1½ feet above the ground; there is no perflation of air under the floor. The roof water is conveyed away by trenches and by the natural slope of the ground; it does not sink into the subsoil, the surface being quite hard. The surface drainage consists of open trenches, and is quite sufficient; the natural slope allows of no lodgment, and is such that little or no artificial drainage is needed. The hospital is built of wattle and dab walls, grass-thatch roofs, and earthen floors; the roof is thick enough, but the walls, from their construction, are too thin. There are five-feet verandahs on both sides, closed in on the monsoon side by weather frames; the verandah is not sufficient, but the building is only temporary. The verandahs are not used for the sick. The hospital consists of one flat. The following table shows the hospital accommodation:— Date of construction, January to July 1858. Total number of wards, 4. Total regulation number of beds, 78.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		Feet.	Feet.	To Wall Plate. Feet.	Including Vacuity of Roof.					Feet.	Feet.
1	20	60	20	10	17,400	870	60	—	12	4½	3
1	20	60	20	10	17,400	870	60	—	12	4½	3
1	12	40	20	10	11,600	960	66	—	8	4½	3
1	26	80	20	10	23,200	890	61	—	14	4½	3

SATTARA.
BOMBAY.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The hospital has a western aspect, and is so placed as to receive the full benefit of the prevailing winds. The windows open as casements, but being like the rest of the building, only of temporary construction, are incapable of excluding the hot winds. 6. Apertures for ventilation are made in the upper part of the walls under the eaves, but they do not afford sufficient. There are no jalousies or jhilmils. 7. There are not any means of cooling the air. 8. There are no means of warming. Cleansing and whitewashing is done whenever needed, generally about three or four times a year. 9. The privies and urinals are in rear of hospital, and are approached by covered passages, as shown in the accompanying sketch. They are kept clean by sweepers. There are no cess-pits. 10. There is a washing-room at the end of each ward sufficient for the purpose. 11. There is a washing room attached to each temporary hospital, convenient and sufficient enough. 12. There are the usual means of washing linen, and they are sufficient. 13. The storage is sufficient and dry. 14. The bedsteads are iron; the bedding, rice-straw mattress and pillows. 15. The hospital kitchen is temporary, 12 yards distant from the wards, not on the side of the prevailing wind. It is furnished with the usual cooking apparatus. The cooking is properly done, and if soup is made in jars, varied enough. 16. The diet tables are kept in the laid down forms in general use. 17. There is a hospital orderly, and until lately a hospital matron, and the attendance, with the occasional help of a comrade in special cases, is sufficient. 18. The sanitary state of the hospital is good, and no epidemic disease, pyœmia, or gangrene have manifested themselves. 19. As might be inferred, the European hospitals being temporary, are defective in some points. 20. There are no fenced grounds or shaded walks or seats for the convalescents, but an airy open space adapted to morning and evening exercise. 21. Up to a late date there was a ward set apart for the reception of women and children; the arrangement at present is not satisfactory, for I think the female ward ought to be kept up. 22. There are no special local hospital regulations. 23. All alterations and repairs, whether sanitary or not, are submitted to and carried out by the military authorities. Diets and medical comforts are solely under medical control. 24. There are no convalescent wards or hospital, but where troops are treated on a large scale, such a ward is necessary.
XIII Burial of the Dead.	1. The burial ground for British troops is about one mile from the station. It is dead to leeward in reference to the prevailing winds, being to the S.E. 2. The area is 17,000 square yards. The soil throughout is *moorum* (trap-rock), decomposed in situ. It is believed that decomposition readily takes place. It is carefully kept. 3. The grave space allowed is 10 × 3, and the interval between graves three feet. The graves are about six feet deep. The ground is new, and no grave has been reopened. Only one body is interred in each grave. Burial takes place at ordinary times within 24 hours. During epidemics as soon as possible. There are no burial-grounds for native troops in camp. 4. The grave yard is never offensive. The practice of burial is according to standing regulations. 5. The dead of camp followers and bazaar people are disposed of according to caste; some burned, some buried. 6. No injury accrues to health from the present practice. 7. I can suggest no improvements.

(Signed) H. J. Pelly, Colonel commanding at Sattara.
Robert Dent, Staff Surgeon.
M. K. Kennedy, Captain Executive Engineers.

Sattara, July 19th, 1860.

MULLIGAUM.

Accommodation - Queen's Troops - Artillery, 26 Non-commissioned Officers and Men.
Queen's Troops - Infantry, 102 " " "
Native Troops - Artillery, 80 " " "
Native Troops - Infantry, 858 " " "

References to Subjects and Queries.	Replies.
1. Topography.	1. The surrounding country is an open level plain; flat and dry. There is no jungle, and but little wood in the vicinity; a river runs close to the bazaar and lines. 2. The elevation of the station above the sea is about 1,300 feet, and from 20 to 25 feet above the nearest water. There is no higher or healthier ground adjoining the station. 3. The nearest mountain or table land is about 35 miles distant, and about 3,200 feet higher than the level of the station. 4. The nearest water is only a few yards distant from the station, but the vicinity is not liable to overflow. There is no broken ground, ravines, or water pits near the station. 5. The station is not encumbered in any manner, but is open and freely exposed to the winds. The temperature of the station is not raised by being exposed to reflected sun heat. The station is exposed to all winds except that from the sea.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	6. The surrounding country is only partially cultivated. There are no works of irrigation. There is no cultivation of rice or of indigo, nor is the preparation of hemp or flax carried on near the station. 7. The town of Mulligaum is three-quarters of a mile distant from the station. 8. The surface of the district is black loam, with sub-strata of trap rock; the ground upon which the station stands was never occupied before. 9. Water is found about 20 feet below the surface during the dry season, and about 15 feet during the rainy season. 10. The rain-fall and surface water sinks into the soil, and thus drains off. There is no adjacent higher ground the drainage from which must necessarily pass into the subsoil of the station. 11. The water supply is derived from the river and wells; there are no tanks. The wells require to be cleaned out once a year; being constantly used, the water remains pure. 12. The water supply is unlimited; its colour is clear and good, but it tastes as if slightly impregnated with vegetable matter. There are no means at the station of ascertaining its chemical composition; most of the water from the wells is hard, but good and not injurious to health. It is raised by hand buckets. No better supply can be obtained. 13. There are no topographical points bearing on the health of the station not included in the foregoing answers. 14. New stations are selected by the Quartermaster-General's Department in consultation with the medical authorities.
II. Climate.	1. The only means and instruments available at the station for conducting and registering meteorological observations are a pluviometer and a thermometer. 3. The climate is generally dry; during the months of May and June very hot, but mornings agreeable up to 10 a.m. Cold weather pleasant, with very few fogs. The only trees are near the houses, a few of the gardens irrigated; the air is pure and unmixed with dust, and dust storms are very rare. The troops are generally healthy, there is good shelter, and the usual diet and clothing required. Drill during the rains and cold season can be carried on till half-past 7 a.m. and after 5 p.m. The most healthy months are during the hot season, from March to middle of June, and October is the most unhealthy month. Fevers and rheumatism are the prevailing diseases. 4. There is no district near the station, the climate of which is more conducive to health. 5. The following are the stations at which I have served, with their comparative salubrity:— Poona—Healthy. Sattara—Very healthy. Bombay—Healthy. Baroda—Unhealthy; much fever and diarrhœa. Hyderabad—Healthy, but periodical sickness prevails. Sukkur—Healthy, but climate very hot and enervating. Dadur—Unhealthy; exceedingly hot fevers prevail. Quetta—Above the Bolam Pass, unhealthy. Aden—Healthy.
III. Sanitary Condition of Station.	1, 2, 3. A map and ground plan of the station and barracks is transmitted. 4. Table of barrack accommodation.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.			Inches.		Feet.	Feet.
No. 1	90	264	21	19	105,336	1,170$\frac{1}{3}$	61$\frac{2}{3}$	22	50	4	3
No. 2	26	60$\frac{3}{4}$	19	14$\frac{1}{2}$	16,737	643$\frac{3}{4}$	44$\frac{2}{3}$	22	6	3$\frac{3}{4}$	3$\frac{1}{2}$
		It has not been considered necessary in the answers to the following queries to describe in detail Barrack No. 2, which is an old building of pucka construction, but of smaller dimensions than would now be given to a barrack for an equal number of men.									
Total -	116										
Guard-room, 1 -	4	33$\frac{1}{3}$	15$\frac{1}{4}$	13$\frac{1}{2}$	6,862$\frac{1}{2}$	This guard-room is divided into three rooms, one for the guard and two for prisoners.		22	5	4 ft. 11 in.	3 ft. 6 in.
Prison Cells, 2 -	1	10	10	17$\frac{2}{3}$	1,766	1,766	100	22	1	3	3

5. The windows are on opposite sides, and open inside, with two glazed shutters. There is a verandah on both sides, and also at the ends, surrounding the barrack room. It is 10 feet wide. There is ample space within the room for the sleeping quarters of the soldiers, but it is believed that there would be no objection to their moving their cots into the verandahs if desired in the hot weather. No other persons use the verandahs. There are no jalousies or jhilmils.
6. The cots used in barracks are of iron, laced with cotton tape. A soldier's bedding consists of one humda mattress, two cotton covers for ditto, one blanket and one sheet. No improvements are suggested.
7. No tents are used in camp.
8. The barracks are ventilated by apertures in the roof, called lift ventilators; the ventilation is sufficient to keep the air pure by night as well as by day, when the windows, as usual in this station, are left open. No apparatus is used for cooling the air for barrack rooms at this station.

MULLIGAUM, BOMBAY.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	9, 10, 11. The barracks are only of a temporary nature, the roof being double-tiled with teak wood trusses, and supported on teak posts. The walls are built of sun-dried bricks. The floors are constructed of moorum, and are raised about one foot above the ground. There is no passage for air beneath the floor. The barracks are only of a temporary description; should they be permanently rebuilt, they would no doubt be on an improved plan. It is thought that permanent barracks should be provided with double roofs and good ventilators, so that there might be a current of fresh air to carry away any hot air between the two roofs, and thus prevent its increasing the temperature of the room below; barrack rooms should also be raised about 15 feet above the ground, the spaces below being used as canteens, libraries, store rooms, &c. It is essential to the coolness and salubrity of a barrack that its wall should be sheltered completely from the sun by broad verandahs. No other suggestions to offer. The barracks and cantonments are kept in repair by the barrack serjeant when repairs of a petty nature are required, and by the executive engineer of the district for more extensive repairs. Repairs are quickly executed. The walls of the barracks are cleansed and whitewashed as often as may be considered requisite. There are no stated intervals for the execution of this work. The barracks are without ceilings. 12. In the lavatory common basins and tubs are used by the soldiers for washing and bathing. Water is supplied by bheesties, and after use passes through the urinals, and is conveyed away by a covered drain into a cesspool, also covered. 13. The cookhouses have no special means of cooking provided, nor any means of supplying water. There is an open drain to carry off the refuse water. There are no conveniences for washing and drying linen in the barracks. 14. There are no drains to the privies, their contents being conveyed to a suitable distance by sweepers. 15. The privies are provided with a similar ventilator to the barracks, and are lighted from an arched opening and fixed venetians. The barracks are lighted at night by hanging oil lamps. 16. The barracks and the surrounding ground are drained by natural nullahs, which find an outlet in a river about half a mile distant. All the surface water is speedily carried away, but the drainage from the lavatory and urinals is inefficient. No portion of the barrack or hospital is damp. The drainage is sufficient, with the exception of that from the urinals, which is received in an objectionable cesspit. There is no well or tank within the influence of this cesspit, which is seven feet square, and 40 feet in rear of the lavatory. The cesspit is 40 feet distant from the men's quarter, and about a quarter of a mile from the hospital. There are no foul ditches. 17. The refuse, manure, &c., which is found within or near the cantonment is removed without delay by scavengers' carts. 18. The surface of the cantonment is kept free from vegetation; there are no old walls, thick hedges, &c., interfering with the external ventilation of the station, bazaar, &c., which is good. 19. The drainage and ventilation of the bazaar is good, and water supply abundant. There are no latrines, and the streets are tolerably open and clean. A regular establishment of sweepers is kept up under the supervision of the superintendent of bazaars; there is only a small detachment of police, and no improvement is necessary. There are no native houses near the station, excepting those in the bazaar, and no dung heaps or cess-pits are allowed. 20. Animals are slaughtered about 200 yards in rear of the bazaar, and to leeward of it; there are no written rules regarding slaughtering places. No nuisance is experienced from the condition of these places, and the offal is buried. 21. The bazaar horses are picketed near the owners' residences, and the place is cleared daily, and the manure burnt. 22. There are no artillery or cavalry stables; nor any regular picketing grounds at the station. 23. There is ample and good accommodation for married non-commissioned officers and men. The married people's quarters are separate from the barrack rooms.
Officers' Quarters.	1. The sanitary condition of officers' quarters is good. The drainage and ventilation also good. No improvements to suggest.
IV. HEALTH OF THE TROOPS.	1. The station, district, and population are healthy. 2. Fevers and rheumatism are the most prevalent diseases among the native population. Cholera is the chief epidemic, and spleen disease is rare. 3. The healthiness of the neighbouring native population is to be attributed to there being little jungle, and the country being generally dry. 4. The troops had been stationed at Poona for upwards of three years, and left there 26th September 1859; fevers and rheumatism were the chief complaints. They arrived at Mulligaum in good health on 2nd April 1860, and since then fevers and rheumatism have been the chief diseases. No portion of the present station is more unhealthy than the rest. 5. The troops are never camped out. 6. I have not been in charge of troops at hill stations. 7, 8. Cannot state whether troops who have been resident for some time on hill stations are more or less liable to diseases on returning to the plains. I certainly approve of hill stations, especially during the hot season. 9. Troops are liable to be attacked with dysentery, liver and heart disease on going to hill stations. 10. The precautions necessary to protect men from these diseases are spare diet, warm clothing, and they should not be allowed to expose themselves to the sun from 9 a.m. to 5 p.m. They should have plenty of exercise morning and evening. 11, 12. The hot season is best adapted for residence in hill stations. Cannot say what is the shortest period to enable troops to obtain the full benefit of such residence; nor whether there is any period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service in the plains. 13. The special precaution for protecting the health of the troops on leaving hill stations for the plains is to prevent their exposure to the sun. 14. Residence on hill stations, with short periods of service in the plains, is most conducive to the preservation of the health of the troops; but cannot say that service on the plains, with short periods of change to hill stations, would be equally conducive to their health; change of station in the plains is decidedly beneficial. 15, 16. Cannot say whether the barrack and hospital accommodation provided at hill stations or sanitaria are sufficient for the health and comfort of the troops. No experience to show what elevation above the sea is most suitable for hill stations.

References to Subjects and Queries.	Replies.
IV. Health of the Troops—*cont.*	17. Sufter Sing, about 60 miles distance from the station by the road, could be advantageously occupied as a hill station. Its elevation above the plain is about 2,000 feet. The range of thermometer under a chupper, from March to June, is 76° to 92°, and seldom above 88°. The climate is most agreeable, and out of the influence of the hot winds. Europeans cannot live there during the rains, it being enveloped in clouds, but it is quite accessible after October, and very healthy. 18. Gravelly soils are the most healthy for stations. 19. Soldiers proceeding to India should be from 20 to 25 years of age, and the best period for them to land there is in November. No knowledge as to the mode of disposing of troops on first landing, but to preserve their health they should be immediately sent to their regiments or depôts. 20. Troops should be sent direct from the home depôts to India; and to diminish the dangers of the earlier years of service they should not be kept out at drill too long in the morning or commence too soon in the afternoon. 21. Mode of transport of troops from the port to the interior is by railway or bullock train, or water carriage and the usual march; sufficient precautions are taken to preserve the health of the troops on the route. 22. A British soldier should serve in India from 10 to 12 years. 23. The manner of conducting the business of medical boards is such as to avoid conflict of opinion as regards invaliding. No suggestions to make. 24. Invalids should leave India for home at the end of the cold season, in February.
Diseases.	1. When European troops are present, there is a weekly inspection for the discovery of incipient diseases according to order. 2. There has been only one case of scorbutus among the troops at this station. It frequently occurs after rheumatism. The preventive measures are, a generous diet of animal food, vegetables, lime juice, and spirits. 3. Disease of the liver is very rare amongst natives; prophylactic measures necessary to diminish its frequency are, spare diet, no beer or spirits, small quantities of wine only, horse and walking exercise, flannel next the skin, and a belt also of the same. 4. Dracunculus is peculiar to those who drink or wash from certain tanks or wells. The water should be heated before used. 5. The proportion of venereal diseases to the total sick is 2·5 per cent. Lock hospitals and supervision over the women in the regimental and other bazaars would be most decidedly advantageous to the health of the army. Women should be registered, and a person appointed to inspect them once a week. This is not necessary in native regiments, where venereal disease is very rare. 6. Cholera and small-pox are the only epidemics among the troops at the station. Of Fevers—122 cases have occurred from all the common types. Dysentery—6 cases, very rare. Cholera—occasionally. Small-pox—occasionally. Rheumatism—23 cases; this disease is rather frequent. The proportions of admissions and deaths from these diseases are 65·3 per cent. of the total admissions, and 0·8 per cent. of the total deaths. 7. Zymotic diseases are generally preceded by languor, general derangement of the digestive organs, and disinclination to any occupation. Intermittent fever is the most common type. The seasons when such diseases are most prevalent is after the rains, when the weather is muggy, hot, and damp. These diseases are prevalent in the most crowded, lowest, and dampest portions of the bazaar. The personal habits predisposing to these diseases are want of cleanliness and good food. 8. The causes of prevalence of epidemic disease amongst the soldiers are, exposure to great variations of climate, excess of duty, and overcrowding of barracks. 9. Small doses of quinine taken before going out is a good prophylactic against malarial diseases. 10. To prevent or mitigate epidemic disease, bathing should be resorted to daily, flannel should always be worn next to the skin, the barracks should be well ventilated, and the men should be exposed as little to the sun as possible.
V. Intemperance.	1, 2. The soldiers at the station are temperate. There are no confirmed drunkards. There are no admissions into hospital from diseases directly or indirectly caused by intemperance. There are no European troops at this station. Drunkenness is always punished as an offence. 3. There is no canteen at this station; spirits are sold at the bazaar by the liquor contractor. There are no data to ascertain the probable amount consumed by each man per diem. Spirit is no part of the soldier's ration at the station, on march, or in the field, except when Europeans are present. Cannot say whether it has happened among the men to take a dram before morning parade. Spirit is never given as a ration to convalescents. No other intoxicating drinks are sold in the bazaar. 4. Small quantities of spirits are not generally injurious to the health of the troops, and are frequently advantageous to convalescents. Spirits are not conducive to the efficiency of the corps. 5. It would be beneficial to restrict the sale of spirits in the bazaar, and only give them as a ration to the troops on a line of march. 6. Malt liquor or wines are much more healthy drinks than spirits, and decidedly more adapted to the climate. 7. Coffee, tea, lemonade, and similar drinks are much used at the station, and their influence on health, efficiency, and discipline, as compared with spirits and malt liquor, is very good and beneficial. 8. It would be beneficial to suppress altogether the spirit ration, whether for soldiers or convalescents, and to substitute for it beer, tea, &c. 9, 10. The sale of spirituous liquors in the canteen should be restricted, and encouragement given to the sale of coffee, tea, lemonade, &c. No recommendations to make, but those already stated. The soldier should have his beer or porter after his dinner. 11. There are no canteen regulations. There is only one liquor contractor in the bazaar, who is subject to the general bazaar rules; his shop is open from sunrise to 9 p.m. No liquor is permitted to be sold to European soldiers when such are present at the station.
VI. Diet.	There being no European troops at this station, no information is given under this head.

ULLIGAUM. BOMBAY.

References to Subjects and Queries.	Replies.
VII. Deesa, Accoutrements, and Duties.	1. The soldier's dress and accoutrements at this station consist of cloth jacket and trousers for the cold season, and white jacket and linen trousers for the hot season, a Kilmarnock cap, pouch and belt, and waist-belt with bayonet. The present dress is suitable to the climate, and for the soldier's duties by day and by night, and at the different seasons. No suggestions to make for dress of native troops. The guard dress is the usual dress, and the men are protected when on guard from the sun and wet by guard-rooms and sentry-boxes.
Duties.	1. Troops should be thoroughly drilled at home before being sent to India. 2. At this station a soldier goes on guard every fourth day. Drill is carried on for an hour and a half, morning and evening, at 5 a.m. and 5 p.m. respectively. The men do not suffer in health from drill. The early morning is the best time for drills, parades, and marches, and the standing orders of the army appoint this time. The soldiers have, on an average, from three to four nights in bed during the week. 3. Guards are mounted about a quarter of a mile from barracks, and the tour of guard is for 24 hours. There are roll calls every morning and evening, but not during the night. Night duty, when light, is not found to be injurious to health.
VIII. Instruction and Recreation.	1, 2. There are no means of instruction and recreation at the station. 3. The institution of soldiers' savings banks would be advantageous. 4. There is not sufficient shade from trees, &c., to enable the men to take exercise without injury to health during the day.
IX. Military Prisons.	1. There is no military prison, defaulters being confined in the quarter guard and cells. These are in a good sanitary state.
X. Field Service.	1. There are no local regulations for field medical service, not included in the general Presidency Regulations. 2. The practical working of the powers of the medical officers, as regards the conduct of the line of march of troops, &c., is good. 3. The brigade major or staff officer is responsible for the regulations of camp being observed; the medical officer can only represent defects, but has no power. No improvements to suggest.
XI. Statistics of Sickness and Mortality.	4. No knowledge of the arrangements adopted in the Presidency for field hospitals, &c.

MULLIGAUM.—EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	QUEEN'S TROOPS.																					
1858-59	7/11 Royal Artillery - - - Detachment H.M.'s 18th Royal Irish Do. do. 56th Regiment - Do. do. 92d Highlanders	51	32	—	—	—	4	—	6	—	12	—	5	—	1	1	77	1	137	2	268·6	3·9
1859-60	Do. 6/13 Royal Artillery - - Do. H.M.'s 3rd Dragoon Guards. Wing H.M.'s 28th Regiment - Detachment H.M.'s 57th Regiment -	118	154	—	1	—	9	—	2	—	21	—	5	—	4	2	70	—	266	2	225·4	1·6

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	11th Regiment Native Infantry -	853	281	—	3	—	6	1	1	—	42	—	9	—	1	—	238	1	581	2	68·1	0·2
1851-52	2nd Company 3rd Battalion Artillery 11th Regiment Native Infantry -	806	171	—	20	—	13	—	3	1	55	2	10	—	3	1	195	2	470	6	58·3	0·7
1852-53	2nd Company 3rd Battalion Artillery 4th do. do. do. 4th do. 4th do. do. 11th Regiment Native Infantry - 22nd do. do. -	868	296	1	3	—	16	2	2	—	57	2	11	—	1	—	287	—	673	5	77·5	0·5
1853-54	4th Company 4th Battalion Artillery 22nd Regiment Native Infantry -	979	166	3	7	—	8	1	2	—	56	2	14	1	—	—	229	—	482	7	49·2	0·7
1854-55	4th Company 4th Battalion Artillery 22nd Regiment Native Infantry -	995	76	1	15	—	7	1	5	1	24	—	5	1	2	—	117	1	251	5	25·2	0·5
1855-56	4th Company 4th Battalion Artillery 22nd Regiment Native Infantry -	975	69	2	12	—	3	—	3	—	57	1	1	—	—	—	125	1	270	4	27·6	0·4
1856-57	2nd Company 4th Battalion Artillery 19th Regiment Native Infantry -	623	222	5	1	—	25	—	—	—	18	—	5	—	—	—	502	—	773	5	124·0	0·8
1857-58	6th Company 4th Battalion Artillery 4th Regiment Native Infantry - 19th do. do. -	1,273	712	3	11	—	133	8	29	1	138	4	23	—	2	1	832	4	1,880	21	147·6	1·6
1858-59	Detachment 3rd Regiment Native Infantry. 19th Regiment Native Infantry - 23rd do. do. - - 30th do. do. - -	384	241	3	16	—	4	—	2	—	37	—	2	—	—	—	254	—	556	3	144·7	0·7
1859-60	3rd do. do. - - Detachment 6th Regiment Native Infantry. - Detachment Candeish Bheel Corps - 3rd Division Military Train - -	604	223	1	7	—	14	—	5	—	49	—	3	—	12	5	217	1	530	7	87·7	1·1

By order of the Acting Principal Inspector-General, Medical Department,
Office of the Principal Inspector-General, Medical Department, Bombay, 9th November 1860.

W. Coles, Assistant Surgeon, Secretary.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1, 2. The hospital is situated in an open space of ground, quite clear of buildings of every description. It is about 100 yards outside the bazaar, the houses of which are the nearest to it. The site is open and freely ventilated, there being no high walls or trees to interfere with ventilation. It is healthy and the drainage is good, and is free from malaria. 3. The water supply is abundant and wholesome. 4. No refuse water lodges in the vicinity of the hospital; a deep nullah runs close outside the compound. 5. The wards are about a foot above the ground, and flagged with cut stone; there is no circulation of air underneath. The roof water sinks into the subsoil. The fall of rain is never heavy, and soon drains off from the slant towards the nullah. The hospital is built of burnt brick and lime. The roof is double-tiled and the walls are double, and of sufficient thickness to keep the building cool. It is supplied with verandahs all round, about 8 feet wide, which afford sufficient shelter from the sun. The verandahs are used for the accommodation of the sick and convalescents. The hospital consists of one flat.

Table of Hospital Accommodation.

Date of construction, 1826–27.

Total number of wards, 4. Total regulation number of beds, 56.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.			Inches.		Feet.	Feet.
2	40	95⅔	21	16½	33,177⅔	829⅔	50¼	22	10	7¼	4½
2 in the same building.	8	22 ft. 10 in.	21	14	6,979 7/18	872⅔	62·3	22	4	4¼	

	The hospital is so placed as to receive the full benefit of prevailing winds. The windows open on hinges outwards; the ward windows have jhilmils. 6. The ventilation of the wards is effected by the jhilmils being kept open when the windows are not entirely so—and is sufficient to keep them at all times free from odour or closeness. The jhilmils are of common construction. 7, 8. There are no means allowed for cooling the air admitted into the ward, or apparatus for warming. The walls and ceilings of hospital wards are cleansed and limewashed once in six months, but oftener if necessary. 9. The privies, &c. are about 20 yards from the hospital, connected by an open passage roofed in. They are not placed over cesspits. They are kept clean by the sweepers, and are not offensive. 10, 11. There are no means of washing or bathing the sick. 12. The hospital linen is taken away to be washed and dried. 13. The storage is sufficient and dry. 14. The bedsteads used in hospital are of wood, with tape; no bedding is allowed. No suggestions to make. 15. A small shed is used for cooking, which is all that is required. 16. There are no diet tables, &c. used in hospital. 17. The attendance at the hospital consists of a hospital orderly and a cook; if a man requires it, he is allowed a comrade from the regiment. 18. The sanitary condition of the hospital is good; no epidemic diseases have ever occurred in the ward. 19. There are no deficiencies or sanitary defects requiring improvement. 20. Convalescents are allowed to take exercise in the compound, which is quite sufficient. 21. Soldiers' sick wives and children either attend the hospital treatment or are seen at their own houses. There should be a ward for women and children, otherwise the present arrangements are satisfactory. 22. There are no special hospital regulations not included in the general Presidency Regulations. 23. The medical officer can at any time get repairs done to the hospital by writing officially on the subject, and can order any medical comforts he may deem necessary at all times. 24. There are no convalescent wards at the station.
XIII. Burial of the Dead.	1. The burial-ground used by British troops is about 100 yards from the cantonment boundary, and well to leeward, and clear of all houses. 2. Its area is 7,350 square yards. In the upper half of the ground the soil is hard moorum, in the lower part there is black soil to the depth of from two to three feet. The drainage is efficient and the ground well kept. Decomposition takes place readily. 3. There are no regulations as to burial, several vaults being built close to each other; the graves are scattered. They are from six to seven feet deep, and are never reopened. Interment takes place at ordinary times, from 12 to 24 hours after death, and within 12 hours during epidemics. The great majority of native troops are Hindoos, who burn their dead on the banks of the river. The Mahomedans bury their dead outside camp limits. There are no particular regulations. 4. The grave-yard is never offensive. With regard to the burial of British troops, the regulation is:—If a soldier dies early in the morning, the burial takes place the same evening; if the death occurs in the evening, the interment takes place the next morning. 5. The dead of the camp followers or bazaar people are disposed of according to caste; the Hindoos burn their dead on the river banks, and the Mahomedans bury their dead in the place set apart for them out of camp limits. 6. No injury accrues to the public health from the present practice. 7. No improvements to suggest for the regulation of the burial or disposal of the dead.

(Signed) J. Field, Captain, Commanding at Mulligaum.
J. C. Trestrail, Surgeon, 6th Regiment, N. I.
(Only one Medical Officer is present at the Station).
J. M. Greig, Captain Engineers.

1st Sept. 1860.

KOLAPORE.

Accommodation — Queen's Troops — Artillery, 1 Company, 3rd Company 3rd Battalion Bombay Artillery.
Infantry, Wing Her Majesty's 83rd Regiment.
Native Troops — Cavalry, 1 Troop Southern Mahratta Horse.
Infantry, 1 Regiment, 10th Regiment Bombay Native Infantry.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. Cultivated valleys bounded by bare mountain ranges to the west, north, and east, form the chief features of the surrounding country. The valleys are undulating, and the soil is composed of black argillaceous mould; the elevated ridges are covered with red soil. There are no swamps. There is very little wood and no jungle in the vicinity. Water is to be found at all seasons in the rivers, and also in the wells, which are numerous, and used for the purposes of irrigation.
	2. The elevation of the station above the sea is 1,797 feet; about 60 feet above the valleys, and 60 feet above the nearest water. There is no higher or healthier ground near the station. The hill fort of Punulla, about 11 miles distant, 975 feet above the plain, however, possesses considerable advantages as to climate, excepting during the monsoon.
	3. The nearest mountain or table land is about three miles distant, and about 900 feet above the station.
	4. The river Punchgunga is the nearest permanent water, and is about half a mile from the station. It surrounds the cantonment on three sides, at an average distance of about two miles. There are two large tanks about three miles from the station. An overflow of water takes place in the vicinity of the river Kistnah during the monsoon, and lasts for a few days only. This may occur twice or thrice during the rains. There are no ravines or water pits near the station.
	5. The station is freely opened and exposed to the prevailing winds. It is almost totally devoid of trees, hedges, and gardens. There exist no impediments to free external and internal ventilation. The buildings are scattered, so that no increase of temperature is occasioned by reflected sun heat. The winds generally are high. The land or north-easterly winds blow from November to February, and give rise to fevers, rheumatism, and pulmonary affections. The sea breeze or south-westerly winds commence in March, and blow during the greater part of the day and night. They are highly beneficial to health.
	6. The valleys in the vicinity are highly cultivated. There are no works of irrigation near the station, although partial irrigation is carried on by means of wells, but is much too limited to produce any deleterious effect on the health of the station. Rice is cultivated, in small detached fields only, within a quarter of a mile of the camp limits. No restrictions appear to have been hitherto made on this head. There is no cultivation of indigo, nor is the preparation of hemp or flax carried on near the station.
	7. The city of Kolapore, with a population of between 50,000 and 60,000, is situated to the south-west, about a mile and a half from the station. The village of Bhovra is about half a mile to the north-west.
	8. The structure of the mountain ridges is principally of basaltic formation, trap-rock, covered with red disintegrated soil, moorum; the surface soil of the valleys is black and argillaceous; the subsoil is of clay of various colours. The red soil is met with on the higher slopes, and during the rains the colouring matter (an oxide of iron) is washed out of it, and carried down as a black powder, which is used as pounce.
	9. Water is found during the dry season between 40 and 50 feet below the surface, in carefully selected site, from 35 to 45 feet, but wells have been abandoned after digging 80 feet. In the rainy season, the wells fill to the natural ground level. The depth where water is found necessarily varies with the locality. In black soil in a valley, it has been met with at 3 feet below the surface.
	10. The undulating character of the surrounding district ensures free drainage. No water from rain or surface springs settles near the station. There is no adjacent higher ground, the drainage from which passes into the subsoil of the station.
	11. The water supply is almost entirely derived from wells. The artillery horses are watered at the river. There is no water for drinking purposes stored in tanks, there being none. The wells are not liable to pollution from leaves or impurities of any kind.
	12. The amount of water supply is too limited in the dry season. The quality of the water obtained from wells, with one or two exceptions, is good, wholesome, and unobjectionable. Its chemical composition and microscopic characters have not been ascertained. It is not hard, and is clear and wholesome. The water is raised by means of buckets, and is distributed by puckal bheesties; but an increased supply, by sinking additional wells, is desirable, and is recommended.
	13. There are no other topographical points bearing on the health of the station.
	14. New stations are generally selected by a mixed committee composed of one or more military officers, an engineer, and medical officer. It is highly desirable that the members for this and similar duties should be specially selected from their known attainments and previous experience.
II. CLIMATE.	1. There are no means or instruments available at the station for conducting and registering meteorological observations except the common thermometer in use in hospitals.
	2. The following Table of ten years' observations, from 1st January 1850 to 31st December 1859, is arranged according to the means at disposal,

References to Subjects and Queries.	Replies.

II. Climate—*cont.*

Months.	Mean Maximum.	Mean Minimum.	Mean Sun Temp.	Rain, Inches.	Winds. Direction.
January	77·2	66·7	92·7	·43	N.E. & S.W.
February	81·6	69·2	95·4	—	N.E. & S.W.
March	87·	75·3	99·7	·58	N.E. & S.W.
April	88·	76·3	100·	1·36	N.E. & S.W.
May	88·8	76·6	94·8	3·64	S.W.
June	81·4	75·8	84·9	6·57	S.W.
July	77·	74·	88·9	11·93	W.
August	76·7	73·4	78·7	5·1	W. & N.W.
September	77·9	73·8	81·6	4·62	N.E. & S.W.
October	80·	74·6	86·2	4·51	N.E.
November	78·3	71·7	93·	·72	N.E.
December	76·5	66·8	93·8	·12	N.E. & S.W.

The above Table is prepared and furnished by Dr. Wicke, Civil Surgeon, Kolapore.

3. During the cold season, viz., November, December, January, and February, the climate is dry, the winds blowing generally from the north and east; dews fall in the early mornings, which are moist and fresh until an hour after sunrise. The climate generally is a very temperate one; there is no severe cold during this or any of the seasons. In the hot season, March, April, and May, there is more moisture, the prevailing winds being south-west, which blow, as a hot wind in the day, and become cool and refreshing breezes after sunset. During the rains the climate is agreeable, though damp, and is cool from strong south-westerly breezes which blow uninterruptedly. The climate is not influenced by tree-planting, canal, or other irrigation; nor is the atmosphere rendered impure by dust, excepting very temporarily. The climate is considered one of the healthiest in the Presidency. The diet and clothing require to be modified according to the seasons. No unusual precautions are found necessary to counteract atmospheric changes. Drill should as far as possible be carried on in the mornings, and in the hot season not prolonged beyond an hour after sunrise. The months of September, October, and November may be stated as those in which disease is most prevalent, with the exception of periodical epidemics of cholera and small-pox. The prevailing diseases are intermittent and remittent fevers.

4. As before stated, the hill fort of Punalla is considered to possess a climate that is likely to prove suitable for a sanitarium for sick and weakly men during a certain portion of the year.

5. The stations at which Assistant-Surgeon Wicke, M.D., Civil Surgeon at Kolapore, has served are Broach, Sattara, and Kolapore. The two latter are pretty equally balanced in point of climate, though the latter is, on the whole, to be preferred. Broach is an unhealthy station. Major Gell, 10th Regiment Native Infantry, has served at Aden, Bombay, Gharra, in Sinde, Bhoog, Tauna, Kurrachee, Deesa, Nusserabad, and Poona; as Assistant Quartermaster-General in Egypt, commanding Punjab cavalry regiment at Burmoo and Dera, Ghazee Khan, and Kolapore. Assistant-Surgeon Murray has served at Hyderabad, Kurrachee, Gharra, Jerruck, Sukkur, Sarkhana, Shillarpore in Sinde, Rajcote, Deera, Nusseerabad, Bombay, Rajpootana, and Central India campaigns, Deopore, near Seronge, Central India, Kolapore. Captain Dickenson has served at Tauna, Bhewady, Surat, Bewda, Ahmedabad, Kursole, Kaira, Bushire, Poona, and Belgaum.

The preceding meteorological observations and replies on topography were kindly prepared by Assistant-Surgeon Wicke, M.D., Kolapore, who was in medical charge of the 10th Regiment Native Infantry, during Assistant-Surgeon Murray's temporary absence with a wing of the 15th Regiment Native Infantry.

III. Sanitary Condition of Station.

1, 2, 3. A map and plan of the station and adjacent country, and ground plan of the barracks is transmitted.

4. Table of barrack accommodation.

Date of construction of barracks for European artillery and infantry, 1857–58. Native infantry lines, 1854–55.

Total number of rooms or huts:—8 barracks, 752 huts for native infantry.

Total regulation number of non-commissioned officers and men:—European artillery, 120; infantry, 348; native infantry, 752.

	Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
									ft. in.			
	European Artillery, 3/3 Artillery, 2.	56	147½	22	14	45,430	811½	58	1 8	31	4	3
	Wing, H.M. 83rd Regiment, 6	54	139	22	14	42,812	792½	56½	1 8	24	4	3
	10th Reg. Bombay N.I. 752.	1	14	8	6	672	672	112	on floor	None.		
Guard Room.	3rd Company 3rd Battalion Bombay Artillery.	7	39½	10½	12	4,977	711	60	1 8	5	3	2
Guard Room.	Wing, H.M. 83rd Regt.	15	44	14½	12	7,656	510	42	1 8	5	3	2
Guard Room.	10th Regiment Bombay Native Infantry.	14	30	20	13½	8,100	578½	43	on floor	4	3½	2½
Prison Cells.	3rd Company 3rd Battalion Bombay Artillery.	1	10¾	7½	12	847	847	80⅝	1 8	1	2	2
Prison Cells.	Wing, H.M. 83rd Regt.	1	10	7	12	840	840	70	1 8	1	2	1½
Prison Cells.	10th Regiment Bombay Native Infantry.	1	8	8	13½	864	864	64	on floor	2	2	2

KOLAPORE. BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides in the European infantry barracks, and on adjacent sides in European artillery barracks. There is a verandah on both sides 5 feet broad and 8 feet high; the verandah is never occupied as sleeping quarters by soldiers or other persons; there are no jalousies or jhilmils. 6. At this station the artillery have some iron cots, and some iron with wooden boards; the remainder are entirely of wood. For reasons hereafter stated the men greatly prefer iron cots. The bedding consists of a couple of native blankets, a wadded quilt, and sheets, but the men of the artillery have, in general, provided themselves with English blankets and extra bedding in consequence of the dampness of the monsoon. 7. The structure and dimensions of the tents used in the Bombay army are as follows (they are of six kinds):—

—	Size.	Inner Walls, No. of Cloths.	Outer Walls, No. of Cloths.	Inner Fly, No. of Cloths.	Outer Fly, No. of Cloths.	No. of Men to each Tent.	Cubic Space per Man.	Superficial Feet per Man.
European soldiers' single-poled tent - -	15 × 15	—	3	3	3	13	137	17¼
„ „ double-poled tent - -	22 × 15¼	—	3	3	3	22	116	15¼
Native soldiers' single-poled tent - -	14½	—	—	—	3	22	30½	7½
„ „ double-poled tent - -	14⅔ × 24⅔	—	—	—	3	30	65	7
European hospital, double-poled tent - -	24 × 15¼	3	3	3	3	20	168¼	18½
Staff Surgeon's single-poled tent - -	10 × 10	—	3	3	3	6	122¼	16½

8. Ventilation is effected in the European barracks by the outer wall being only six feet high, and the space between the top of the wall and the roof being fitted with bamboo mat frames, which can be raised or lowered according to the state of the weather; also by doors and windows. The ventilation is sufficient for the purification of the air by night and day, from the strong breezes that prevail at this station. No means of cooling the air of barrack-rooms exist, nor is the want of such apparatus felt at this station in so excellent a climate. Huts or lines for the native infantry are generally too low, and are constructed without any regard to ventilation or adequate drainage; they are seldom in such repair as they would be were they properly built originally, and kept in good order by Government.

9, 10. The barracks are principally built of timber frame-work, the space between the posts being filled up with burnt bricks set in mud; the roofs are covered with single tiles, and the floors are of moorum, and are raised two feet above the level of the ground; there is no ventilation from beneath the floors.

11. The barracks were originally intended to be merely temporary; they were framed of timber which had returned from Persia, but by building up the walls, &c., they may be considered as permanent, and upon the whole as suitable to the climate. Double tiling would be a decided improvement, and would render them drier in the monsoon. The barracks and cantonment are kept in repair by the engineer's department. Repairs are quickly executed. The cantonment staff officer, according to separate general order, is responsible for the cleanliness of the camp. As a general rule the walls of the barracks are limewashed once a year, but oftener if necessary.

12. The washing places are attached to the barracks outside the verandahs, they are of simple construction, being merely stone paved floors, and raised masonry platforms for the hand basins. Only one washing place is attached to each barrack; the water is kept in casks, which are filled by the bheesties as required; the waste water runs through the urinary, and from thence to a cesspool, from which it is removed by sweepers. There are no baths, and the lavatory arrangements altogether are very defective.

13. The cookrooms are provided with no other means of cooking besides the ordinary fire-places; water is kept in casks supplied by bheesties; and waste water runs from a sink through the wall into a cesspool outside, from which it is removed by sweepers. The arrangements for washing are not carried on in barracks in this country.

14. The privies are of the following construction:—The excreta fall on the floor of the privies, which is paved and slope outwards and downwards to a drain, by which fluids are carried off to a cesspool; this is emptied by the sweepers, who also remove the deposit from the paved slope through the openings in the rear wall; it is then carried by the sweepers in buckets and deposited at a certain distance from camp.

15. The ventilation of barracks has been replied to in question 8. In the cookrooms ventilation is secured by raising that portion of the roof immediately above the fire-place about six inches higher than the rest of the roof. The barracks are lighted at night by the ordinary brass hanging oil lamps, three of which are in use in each barrack room.

16. There are no arrangements for draining and sewering the barracks. The natural drainage is good. The men's lavatories, urinaries, kitchens, &c., are drained into cesspits, which are regularly emptied by the sweepers at daylight, and purified with lime. Excepting during the monsoon the barracks are airy and dry, but it is then found necessary to have charcoal pans burning, in consequence of the moisture of the air. A small cesspit is attached to each bathing room, urinary, and privy. To each married man's quarters there is a bathing room with a cesspit. The nearest well is about 200 yards from the artillery barracks; about a quarter of a mile from the European infantry ones; and about half a mile from the hospital. There are no foul ditches.

17. The surface refuse is collected in carts, and deposited at a certain distance from camp, where it is periodically burnt.

18. There is very little vegetation of any kind in the cantonment. There are no old walls, thick hedges, &c. to impede the ventilation of the station, bazaar, &c.

19. Cantonment bazaar is kept clean, is sufficiently drained, and is not overcrowded. The local arrangements are under the superintendent of bazaar and police.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	The following are the local arrangements for preserving cleanliness in the station bazaar at Kolapore:— The whole of the filth and rubbish which accumulates at the bazaar is collected by the inhabitants in baskets every morning, and is placed in front of their houses. These baskets are emptied into a scavenger's cart kept up by the Government for the purpose. The contents are deposited in an open space about 350 yards to the east of the bazaar and burnt. One sweeper is maintained by Government, and the filth collected by him is thrown into a nullah about 400 yards to the eastward of camp, where the bazaar people resort for the purposes of nature. All stagnant water is removed every morning by the bazaar sweeper, or by sweepers kept up by the inhabitants. Two bazaar peons and two of the night police maintained by the inhabitants, prevent any nuisance being committed within camp limits from 4 a.m. to 10 a.m. daily, and all offenders apprehended are fined by the superintendent of the bazaar and police. These arrangements have hitherto proved sufficient. There are no native houses in the vicinity of the station. 20. The slaughter ground is to the east or leeward of camp, and is about half a mile distant. No nuisance is experienced from it in the cantonment. 21. There are only about six tattoes in the bazaar, they are stabled with the buffaloes of the milkmen. Bullocks are picketed in an open space to the north of the bazaar. The whole of the refuse grass, manure, &c. is daily removed by the bazaar cart. 22. The artillery stables are open sheds. They are situated to the leeward of the artillery barracks, but to the windward of the infantry ones. The manure is removed daily. The dung is sold or made into fuel and taken to a distance. The urine is allowed to evaporate, and to a certain extent deodorized by means of lime. The stables are nearly a mile from hospital. 23. The accommodation for the married people is sufficient. None of them occupy barrack rooms with the men. The patcheries, however, are of a very slight temporary description, and would require improvement were it decided to locate European infantry here permanently. They are damp during the monsoon.
Officers' Quarters.	Officers reside in separate bungalows, the compounds of which are kept clean. They are, from their position on a ridge, well drained naturally. Any inattention to cleanliness would receive due notice from the station authorities. No improvements are suggested.
IV. Health of Troops.	1, 2, 3. The station of Kolapore is a very healthy one, the mortality amongst the Europeans being lower than in any other cantonment in the Bombay Presidency. From January 1830 to December 1849, out of an average strength of 292, the deaths were only 20·54 per 1,000. The entire district enjoys more or less the influence of a sea breeze, which commences in the afternoon or evening, and tempers the westerly winds in April, May, and June, and renders the hot weather much less debilitating than at most stations. It is even considered in some respects superior to Belgaum in point of climate. Amongst the native population the endemics are intermittent and remittent fevers, guinea worm, tape, round, and thread worms, and itch. The epidemics are cholera, small-pox, and measles. Its salubrity is no doubt attributable to its elevation,—1,797 feet,—to the open nature of the country in the immediate vicinity of the camp, freedom from luxuriant vegetation, and to its free exposure to westerly and south-westerly winds. 4. The only force that has been here any time is the 3rd company 3rd battalion of artillery, which is a newly raised one. The men composing it were drawn from different stations. It has been located here for two years and a half, and has enjoyed excellent health. It has suffered from intermittent fever, but not to any extent. The native infantry lines are perhaps the least healthy, the wing of the 15th Regiment N.I., that was here last year, having suffered from cholera, which, however, was attributed to defective drainage, and to the existence of concealed cesspits in or near some of the huts. 5. The system of camping out has not been practised here, as the troops have been much moved about latterly. The 10th Regiment N.I., for example, has just returned from field service in Rajpootana and Central India, and with the exception of a three weeks' halt in the first monsoon, has passed upwards of two years under canvass. 6. Our experience of hill stations is confined to a short sojourn at Mahableshwur. 7. We have no data to furnish, but consider that a residence at hill stations would not only lessen the liability to fever, but would tend generally to diminish the predisposition to climatic disease which is occasioned by a protracted residence in the plains. 8. We highly approve of selecting hill stations for troops when practicable. 9. In the Himalaya group, Kussowlie, Subathoo, Simla, and Dugshai, troops are liable to hill diarrhœa to a greater extent evidently than on the few hill stations on the Bombay side. 10. Bowel complaints might in some measure be guarded against, so far as they possibly could, by the use of flannel under-clothing, pure water, attention to cleanliness, clearing the jungle, thorough drainage, and a strict system of conservancy. 11. In the Deccan hill stations the hot weather and post monsoon are the most suitable seasons for residence there. The shortest period of residence to derive benefit from hill stations is from one to two years; but even a single hot season on the hills has a remarkable effect on individuals, free from organic disease, debilitated by service and hard work in the plains. 12. Not aware of any period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service in the plains. 13. The precautions for protecting the health of the troops on leaving hill stations for the plains are to make the transition easy and to avoid too long marches and exposure to the sun. 14. As a general rule it is advisable to have European troops located periodically on the hills, and especially to canton them as much as possible on high table lands; stations such as Belgaum, Kolapore, and Poona proving very suitable to the European constitution. Until the system of railways, however, is much more advanced, stationing troops on the hills can only be hoped for, as a large portion of the army will be required in the plains to preserve order amongst a mixed population, as well as to curb warlike robber tribes on the frontiers. It would doubtless prove most beneficial to have European children after five years of age sent to the hills, and to arrange that the European soldier should pass one year in five in a climate more suited to his constitution than the enervating one of the plains. Change of station in the plains is beneficial, and is very requisite in unhealthy localities.

KOLAPORE. BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of Troops—*cont.*	15. The sanitaria on the Bombay side are very limited. Those in the Deccan were some time ago fully reported upon by Dr. Morehead, then superintending surgeon, Poona division—one of the highest authorities on Indian diseases. 16. The elevation of Mahableshwur and Mount Aboo is 4,500, but a less height would evidently prove suitable. At Poonagunee, 4,000 feet, the rains are comparatively light, amounting to about 50 inches, while Mahableshwur is uninhabitable during the monsoon. 17. Punulla, a dismantled hill fort 11 miles from this station, is 975 feet above the plains, and has a climate suitable for a sanitarium, excepting perhaps during the monsoon, when it would in all likelihood be too damp, from being enveloped with clouds. It bears a high reputation among the natives, who declare that cholera has never been known to enter the fortress. The water is said to be good and pure, and slightly impregnated with iron, which abounds on the hill. 18. The most healthy soils for stations have been sandy gravelly soils, through which water readily percolates; moorum red soil, compound disintegrated rock (trap), coloured with oxide of iron. The worst met with by me in the course of 16 years' service was the limestone formation at Sukkur, Hydreabad, and Tatta. The presence of iron in the soil has not been found injurious to health, as ironstone is met with at some of the most healthy stations in the Bombay Presidency—at Mahableshwur, Punulla, Kolapore. When the 10th Regiment Native Infantry was at Supree, in Central India, which is a very healthy station, ironstone was found to be common. 19. Soldiers proceeding to India should be about 20 years of age, or when the constitution is sufficiently formed. The best period for troops to land in India is early in November, at Bombay, Kurrachee, and Calcutta. Recruits for the Indian army are usually landed at Bombay, and thence dispatched to their different stations, being supplied before starting with light clothing and bedding. If proceeding to the Deccan, they are forwarded by rail to Poona, from which they are marched to their respective stations, and on arrival at regimental head-quarters are sent to drill. To preserve their health they should be carefully looked after at the Presidency, at once dispatched up the country to their respective regiments, and in no case detained long at the Presidency towns, where they are extremely apt to be led into vice and intemperance. 20. Troops should be sent direct from home, as no perceptible advantage would be derived from residence at an intermediate station. To diminish the dangers of the earlier years of service they should be sent to a healthy station, such as Poona or Belgaum. The former has the recommendation of easy access by rail, but the latter has the advantage in point of climate. 21. The arrangements relative to the transport of troops are made by the quartermaster-general's department. It may be stated generally, however, that water transport, when available, should be adopted—steam in preference to sailing vessels—and that sending troops by country craft should be entirely discontinued. Pattinars have long been considered as unfit for the public service, being from their form, construction, and rig unmanageable in rough weather, when, moreover, they are liable to capsize from having to wear, being unable to tack. 22. The number of years a British soldier should serve in India varies according to circumstances, from 12 to 15 years. 23. There is rarely any conflict of opinion with regard to invaliding at the medical boards, as the committees are entirely composed of medical officers, who should, however, be selected for this important duty, and not be taken from the roster. In mixed committees for the examination and passing recruits, for example, it is different. To rectify any defects in their constitution, it should be made imperatively necessary for all recruits to be finally passed by the regimental medical officer, who is more interested than strangers in selecting only thoroughly effective men for his regiment. 24. Invalids should leave India in January, so as to reach home in the summer.
Diseases.	1. There are regular weekly inspections in the detachment 56th Regiment for the discovery of venereal disease. 2. There has been no scorbutus among the European troops. The 10th Regiment Native Infantry has been too short a time here to enable me to form an opinion regarding native troops suffering from the disease at this station. Moreover, many of the men have brought a scorbutic taint with them from Central India, the result of long-continued over-work, hardship, and privation. As a preventive measure to this disease, greater encouragement should be given to gardening and to the cultivation of vegetables at all large stations. 3. The proportion of hepatic disease treated in the 3rd company 3rd battalion Artillery is small, only three cases of hepatitis having been in hospital in the last two years. The climate of India is the principal cause of hepatic disease, which arises from long continued exposure to a high temperature, the disease occurring on exposure to the sun, and great diurnal changes, in the most abstemious, as in the case of the French traveller Jacquemont, as well as in intemperate habits. Addiction to spirits no doubt induces organic disease of the liver, which is followed by intestinal hemorrhage and dropsy. This form of disease might in some measure be obviated by the use of malt liquor instead of spirits; by active habits and attention to the state of the skin; by the daily use of the swimming bath, which is a most important means of preserving health. 4. Dracunculus is rare among the European troops, but is prevalent among the natives here. The origin of the disease is still involved in obscurity. It arises from the use of water containing the worm or its germ, but whether from drinking or from bathing in such water, is still an open question. Her Majesty's 8th Hussars and 10th Regiment Native Infantry suffered considerably from the disease last year, and evidently contracted it in the jungles near Seronge in Central India. 5, 6. The following table shows the admissions from venereal diseases in the hospital, 3rd company 3rd battalion Artillery, during the last two years. It would be advantageous to establish lock hospitals at all large stations where Europeans are located. The troops at the station do not suffer from epidemic or endemic diseases to any extent. The only corps that has been stationed here for any length of time is the 3rd company 3rd battalion Artillery, the detachment of the 56th Regiment having been here for little more than two months and the 10th Regiment Native Infantry for a month and a half.

References to Subjects and Queries.	Replies.

ABSTRACT showing the ADMISSIONS and DEATHS from the following DISEASES during the last Two Years at Kolapore Hospital, 3rd Company 3rd Battalion Bombay Artillery.

Diseases.	1858-59. Average Strength, 103.		1859-60. Average Strength, 93.		Of Fevers there were	1858-59.		1859-60.	
	Admissions.	Deaths.	Admissions.	Deaths.		Admissions.	Deaths.	Admissions.	Deaths.
Hepatitic - - -	—	—	3	—	Febris Ephemera -	6	—	3	—
Venereal - - -	37	—	29	1	„ Ints. Quotidiana	11	—	8	—
Dysentery - - -	7	3	1	—	„ „ Tertian -	1	—	—	—
Cholera - - -	—	—	—	—	„ „ Quartana -	1	—	—	—
Smallpox - - -	—	—	—	—	„ Remittens -	1	1	—	—
Rheumatism - - -	12	—	3	—	„ Continua - -	5	—	1	—
Fevers - - -	25	1	12	—					
All other diseases - -	91	—	71	1					
	172	4	119	2		25	1	12	—

Daily average sick, 1858–59 - 7
„ „ 1859-60 - 4

IV. Health of Troops: *Diseases*—cont.

7. The more frequent zymotic diseases are,—endemic, intermittent, and remittent fevers, epidemic cholera, small-pox, and measles. The former occur mostly at the termination of the rains, when there is considerable diurnal variation of temperature—hot days and cool mornings and evenings. Cholera and small-pox appear generally in the hot weather, the former in close, sultry, or muggy weather, with a highly charged electrical state of the atmosphere. The station bazaar is healthy; the dwellings are clean, and not overcrowded, and it is well drained. The native population generally are predisposed to disease from neglect of sanitary arrangements in the vicinity of their dwellings.
8. With regard to the influence which the soldiers' duties and occupations in barrack, &c., have on the prevalence of epidemic disease, it is difficult to reply more than generally. The more varied and agreeable a soldier's occupation is rendered, the better will be his health. In the field and on the march his health is usually good, from his enforced regular habits, free exercise in the open air, and the absence of means of dissipation. On his return to the routine of camp life he enjoys a less high state of health, caused to a certain extent by the less exciting nature of his employment, but more, perhaps, from the greater opportunity of indulging in intemperance in all large cantonments.
9. Small doses of quinine have not been tried at the station as a prophylactic against malarial diseases.
10. The station might be improved by sinking additional wells, so as to ensure a sufficient supply of good water during the hot season, when it is apt to become somewhat short. Planting trees might also be recommended as likely to add to the salubrity of the station. But the chief and most urgent measure as preventive of disease would be entirely to abolish cesspools and urinaries, and to introduce "the dry system of conservancy," as in Bengal, of removing all excreta in moveable iron pans, and of emptying them into filth carts morning and evening. Under the present system it is impossible, even with the greatest care and vigilance, to prevent the vicinity of cesspools and urinaries from becoming very offensive during light winds or calm weather. The only drains that it is desirable to continue are those connected with the lavatories, and those for the efflux of rain water.

V. INTEMPERANCE.

1. The soldiers of the detachment 56th Regiment are considered to be temperate. The 3rd company 3rd battalion Artillery are considered to be somewhat intemperate, and to have about five per cent. drunkards in the company, though no case of habitual drunkenness has occurred for a very long time.
3. In the hospital, 3rd company 3rd battalion Artillery, the admissions from delirium tremens were:—In 1858–59, 3 cases; in 1859–60, 3 cases. Drunkenness is always punishable as an offence.
3. In the Artillery canteen arrack is sold at 25° below proof, and is issued at the average rate of one dram per man daily. It is always paid for, excepting when artillery are serving on board ship, when it forms part of the ration. No spirits are issued in the Artillery canteen until the evening. Spirit is no part of the soldier's ration, excepting, perhaps, in the field, when it is considered necessary. When spirit is given to convalescents, it is by the special direction of the medical officer, and is always limited and of the best quality. In the bazaar an inferior description of ginger beer is sold, called "pop," which is decidedly injurious to health, and is apt to induce bowel complaints, and even cholera.
4. In moderation, spirit does not seem materially to affect health or prove injurious to discipline. The officer commanding detachment 56th Regiment distinctly states that the quantity allowed, of one dram to each man, is not detrimental to the internal discipline of the detachment.
5. It would not prove beneficial to the health of the troops to abolish the use of spirits in the canteen, as the men would very soon find a substitute in the cheaper and more deleterious spirits of the country, easily procurable at all large stations. At this station men have been known to have delirium tremens, caused chiefly, if not entirely, from the use of eau de Cologne, or what is sold at the bazaars as such.
6. The use of malt liquor is greatly preferable to that of spirits. Wines of a good quality would be beyond the soldier's means.
7. In the Artillery, tea, coffee, &c. are much used, and their consumption is encouraged as much as possible by the commanding officer. Their influence on health, efficiency, and discipline is undoubtedly beneficial.
8, 9. It would not be advisable to suppress altogether the issue of spirits from the canteen store, but something might be done by gradually substituting and cheapening the supply of beer.

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References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	10. The use of tea, coffee, and lemonade should be freely encouraged, and, as far as practicable, the use of beer should be substituted for spirits. This can only be done in cantonments. In the field, during war, beer and porter cannot be carried about. In Central India, officers as well as men had occasionally to depend on the commissariat department for arrack, from the difficulty of getting carriage and from the nature of the country in which operations were carried on. 11. The following is an abstract of the more important canteen regulations:—The canteen of the 83rd Regiment is open at noon for the issue of porter, and for the issues of porter and arrack from 2 to 3, and from 7 to 9 p.m.; when tattoo beating begins at 8 p.m. it is open from 6 to 8 instead of 7 to 9 p.m. The allowance of liquor to any one man is one quart of porter and one dram of arrack per diem. If he receives the quart of porter at noon he is not allowed to draw any more porter, and only one dram of arrack for the remainder of the day. If he receives only a pint of porter at noon, he can have the remaining pint and one dram of arrack in the evening; but whether he receives a pint of porter or no porter at all at noon, he can receive no more than one pint of porter and one dram of arrack in the evening, No liquor, without permission of the commanding officer, is allowed to leave the canteen except the porter at noon. No person not belonging to the regiment can receive liquor from or in the canteen. All issues from the canteen are paid for in ready money. No man on guard or picquet, or for reinforcement, or convalescent, or defaulter, is allowed in the canteen, and no liquor is allowed to be sold directly or indirectly from there to any native whatsoever. The canteen of the 3rd company 3rd battalion Artillery is opened at the following hours, 7 a.m. to 7.30 a.m. for the issue of one pint of porter; 12 noon to 12.30 p.m. for the issue of one pint of porter; and from 7 p.m. to 8 p.m., when the men can procure one pint of porter and one dram of arrack. There are no local bazaar regulations; those contained in 2nd Supplement to Jameson's Code are duly acted up to. No liquor is allowed to be sold in the bazaar to European soldiers or their wives or children, nor is liquor allowed to be brought into camp by unauthorized persons.
VI. DIET.	1. The composition of the ration is as follows:—

—	Queen's Troops.	—	European Troops in the Indian Army.
	lb. oz.		lb. oz.
Bread - - -	1 0	- - - -	1 0
Meat—Beef - - -	1 0	Beef or Mutton - -	1 0
Tea - - - { Black / Green	0 $\frac{10}{21}$ / 0 $\frac{5}{21}$	} - - - -	0 $0\frac{5}{7}$
Sugar - - -	0 $2\frac{1}{2}$	- - - -	0 $2\frac{1}{2}$
Rice - - - -	0 4	- - - -	0 4
Salt - - - -	0 1	- - - -	0 1
Potatoes - - -	0 8	- - - -	0 8
Mixed Vegetables - -	0 8	- - - -	0 8
Firewood - - -	3 0	- - - -	3 0

The only changes are from beef to mutton, and from bread to biscuit, and in the vegetables, which vary according to the season of the year. The ration is inspected by the commissariat officer, the orderly officer, and the non-commissioned officer on duty. That of the sick in hospital is inspected by the medical officer.

2. A complete ration, including vegetables, is provided. In the 56th Regiment the stoppage is 3 annas 4 pice a day. In the Artillery each man pays 2 pice a day for fruit and spices for puddings. Breakfast, dinner, and supper are taken at 8 a.m., 1 p.m., and 4 p.m., respectively. In the hot weather a change might be advantageously made by having a light meal in the middle of the day and the principal one in the evening; but it is not certain that the men themselves would prefer the arrangement. The proportion of vegetables in a ration is one pound.
3. The rations issued are excellent. They might be varied more from beef to mutton. In the Artillery the men change the rice for a supply of milk for their tea. A small quantity of milk might be added to the ration, and some butter, perhaps, during the rains and cold weather.
4. The kitchens are good, but the camp kettles are too large, and there are no means of roasting the meat. The kitchens are clean, open, and well ventilated, and sufficiently supplied with water. The food is either boiled or fried. It is properly done, but not sufficiently varied, from the want of roasting apparatus. Tea is properly prepared. In the Artillery arrangements are made to have coffee prepared for the men, either before a march or as a refreshment half way; but this is not the case in the 56th Regiment detachment.
5. Gardens for the cultivation of vegetables would be advantageous in many respects, by employing the men out of doors and affording an agreeable relaxation from the dull routine of camp life. They should be under the superintendence of officers selected for the duty by the commanding officer.

VII. DRESS, ACCOUTREMENTS, AND DUTIES.

1. The soldier's dress in the Artillery consists of cloth tunic and trousers, serge jackets and trousers, khakee light clothing, and helmet with turban over it. The accoutrements are, sword belts and knapsacks, the latter is only worn on heavy marching order parade. In the 56th Regiment khakee clothing is worn during the hot season, and shell jacket and cloth trousers during the rest of the year. Woollen clothing, light or thick, according to the season, should be worn by men exposed to night air, and flannel under-clothing throughout the year, but particularly during the monsoon, the neglect of which precaution is apt to occasion bowel complaints. During the hot weather the men should wear cotton socks, and woollen ones during the rest of the year. The men on guard wear cloth clothing, excepting in the day in the hot season. The helmet is by far the best and most suitable head dress for the climate. Its construction, however, is open to improvement as regards durability and lightness. The dress of the men of the 10th Regiment Native Infantry is, for parade, forage cap without cover, cloth shell jacket or tunic, and American drill fatigue trousers. In cold weather, cloth trousers are worn on all duties before 8 a.m. and after 6 p.m., and guards wear great coats during the night. For summer clothing, white clothing cut tunic

References to Subjects and Queries.	Replies.
VIII. Dress, Accoutrements, and Duties—*cont.*	fashion has been introduced, and has been directed not to be dyed until a regiment is ordered on service. This would occasion considerable inconvenience, even were it always possible to dye some 1,500 tunics khakee coloured at a short notice. A peak is very much required for the forage cap to protect the eyes from the intense glare of the sun. This could easily be introduced without any general order being issued that would excite remark. Were it intimated that its use would be permitted, the native officers would at once adopt it, and it would become generally appreciated by the men. The shoes now in use are of a bad description, and of country leather, which becomes worn out in a short time in wet weather. It would be preferable were Government to provide the article in the same way as to European troops. The want of good shoes was severely felt by the 10th Regiment Native Infantry, which underwent no ordinary hardship and privation in the Central India campaign, having in the course of two years marched 3,689 miles. The committee beg to recommend loose serge coats and khakee clothing, the same as is used by European Infantry, instead of the present dress, for regular Native Infantry. The accoutrements are, buff waist and shoulder belts, with bayonet frog and scabbard, black leather pouch, with 10 rounds of ball ammunition. The present accoutrements are badly slung, the whole weight of the ammunition being thrown on one shoulder, and the one too that has to bear the weight of the musket. This could be obviated by dividing the ammunition into two smaller pouches. The knapsack when packed is too heavy, and is, moreover, quite unsuited to the natives, for when likely to come into use on a forced march it cannot really be carried without exhausting or distressing the men. A better and more serviceable haversack is desirable.
Duties.	1. No apparent material advantage would be derived from drilling troops at home. It would seem preferable to have them drilled in this country by the officers and non-commissioned officers under whom they have to serve. 2. The usual routine of soldiers' duties at this station are:—Artillery, morning parade or drill from 5 to half-past 6 a.m. Stables, 6.25 a.m. to 7.30 a.m. Breakfast, 8 a.m. Orderly room, 9 a.m. Cleaning harness, arms and accoutrements, and barracks, until noon. Dinner 1 p.m. Supper, 4 p.m. Drill or stables, 5.30 p.m., and in evening, tattoo roll call. 56th Regiment detachment.—Guard mounting and drills, twice a day, three-quarters of an hour morning and evening. The best hours for drills are early in the morning, earlier in the hot than in the cold weather. With regard to marching, the instructions in separate general orders are as clear and distinct as could be wished. The commanding officers, however, often assume large discretional powers in marching, evidently from want of due appreciation of the importance of preserving the energy of the men from the effects of the sun, which seems to operate more quickly on a soldier, fatigued at the end of a march, buttoned up and accoutred, with a rifle and supply of ammunition, than it would do on the same individual disencumbered of his arms and lightly dressed. The Artillery have five nights and the 56th Regiment six nights in bed during the week. The 10*th* Regiment Native Infantry have morning parade every day, Sundays and holidays excepted, averaging about one and a quarter hours in duration. Orderly room at 8 a.m.; evening roll call and inspection parade, once a week. Evening parade for non-commissioned officers, three times a week. On weekly holidays roll call is taken at tattoo beating. The average nights in bed for privates are three; for naiques four; for havildars, five. Guards last for 24 hours day and night, and are mounted in the main street in the regimental lines. They are, with one exception, within half a mile of the lines, and the treasury is three miles distant. The European Infantry mount guard in barrack square and are relieved every 24 hours. There are roll calls at morning parade, breakfast, dinner, evening parade, and tattoo, and check roll calls when required. The night duties here are light, and do not have the same effect as in unhealthy stations. With regard to the movement of troops, by special general orders, long and distressing marches, unless under special orders or emergencies, are strictly forbidden. The hours of marching must depend on the season, climate, state of roads, distance, and service; but on ordinary occasions, when troops are not in an enemy's country or disturbed district, or in charge of prisoners or treasure, it should be so timed as to bring them to their ground by or soon after sunrise; all unnecessary exposure being sedulously avoided, as prejudicial to health.
VIII. Instruction and Recreation.	1. The means of recreation and instruction are as follows:—There are no ball courts, but the Artillery have skittle grounds in the lines. There is no adult school. The Artillery have a library, which is well lighted. There is no day-room or soldiers' clubs. There are no soldiers' gardens, but the Artillery cultivate small plots of ground during the rains. There are no workshops or gymnasia, but there is a station theatre, which is out of repair, and which has fallen down since the preparation of this report. The means are not sufficient to keep the men occupied during the wet season and during the heat of the day. The commanding officer of the Artillery does not restrict his men, but permits them to expose themselves as they please, and encourages them in getting up cricket matches. In the 56th detachment the men are not allowed to expose themselves unless on duty. 2. A ball alley should be built, and plunge baths established, as the men have no means of keeping themselves clean properly, from the defective lavatory arrangements in the barracks. Indeed in all stations where European troops are located, plunge baths should be built, as they are most essential to the health of the troops. In several stations they have been already introduced, as at Kurrachee, Belgaum, Kulladgee, &c. Their effect on the health of the troops can hardly be overrated. 3. Soldiers' savings' banks are already established at the station. 4. There are no trees in camp to afford shade, but there are good verandahs to all the barracks.
IX. Military Prisons.	1. The European cells can scarcely be considered as good, the cubic space being less than the minimum allowed in barracks for European troops in Bengal Public Works Code. There are moreover no wash-houses for the prisoners.
X. Field Service.	1. There are no local rules for field medical service which are not included in the Bombay Medical Code, Section XI. 2. With regard to the powers of the medical officers, as to the conduct of the line of march, of troops bivouacking, camping, billeting, &c., the rules for encampment on service are laid down in pages 143–4–5, separate general orders; and ordinary camping in page 81 of the same, but contain no reference to medical officers. These arrangements are entrusted entirely

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	to the commanding officer. This renders it a matter of considerable delicacy for the medical officer to offer any suggestion, as such recommendations are not always well received. To illustrate the working of the present system a few instances had better perhaps be adduced. In a cavalry regiment that had a short time previously arrived in the country, the corps was marched late and kept out in the sun. The result was that the men suffered from exposure and the sick list increased. The surgeon represented to the colonel the advisability of marching earlier, but was not attended to. The next occurred in an infantry regiment, which, on account of an outbreak of cholera, was moved into tents. The colonel, from a want of knowledge of sanitary matters, had the tents so closely pitched that the ropes nearly interlaced. The surgeon ventured to suggest that the tents were too close to allow of proper ventilation, and was publicly informed that it was no affair of his. He accordingly reported the matter to the brigadier, who personally inspected the camp and ordered every second tent to be taken down and pitched elsewhere. In giving another illustration of the disregard of medical officers' opinions, there is no reason for withholding the details, as it has already appeared in print. At the end of April 1846, the 22nd Regiment Bombay Native Infantry was ordered from Mhow to Baroda, and Dr. Arnott, the surgeon in charge, remonstrated against the march being undertaken at such an advanced period of the year, and as cholera and small-pox moreover were then raging along the line of march. His representation however was not attended to, and within ten days of leaving Mhow there were 300 cases of cholera, of which 200 died. Dr. Arnott too, a good and zealous officer, fell a victim to the disease, and the regiment was left in the middle of the jungle without any medical aid. 3. The regulations for preserving the health of troops in camp are laid down in separate general orders, an extract from which is appended. Ventilation and water supply come only to a limited extent within the province of the regimental medical officer, whose duties are confined to the details of station and field hospitals. At large military stations the senior medical officer has latterly been nominated sanitary officer, and is thus permitted to make recommendations bearing on the health of the troops. The power, however, of the medical officer in the matters referred to is very restricted, being confined to submitting suggestions to the military authorities, which may or may not be received in good part. The result is that medical officers are somewhat reluctant to interfere unless obliged to do so officially through the occurrence of sickness. During the two last years on field service in Rajpootana and Central India I only recollect of having once offered a suggestion to the commanding officer, and that was in a private form to the officer now commanding the regiment, who is a personal friend of many years' standing. It would be preferable were it clearly laid down to be the duty of the medical officer to advise the commanding officer in all questions relative to the health of troops, as he is fully as responsible for the health of the regiment as the commanding officer is for the maintenance of discipline and proper interior economy, having annually to furnish a detailed statistical account of his charge to the Director-General at the Presidency. Any cases of difficulty or doubt could easily be set at rest by a reference to the Deputy Inspector-General of the division, which course would ensure attention and discretion, and would prove more conducive to the interests of the public service than the present arrangement, by which the sphere of usefulness of medical officers is in a great measure limited to the details within hospital. Since the above was written, the Director-General's quarterly sheet of general orders and medical circulars of the last quarter contains the following:—In a general order, 11th February 1860, regimental medical officers have been directed as at home to frequently examine into the state of the barracks, of their environs, and to suggest any improvements that may appear necessary to the commanding officer. Copies of such suggestions to be invariably forwarded to the Director-General's office, Bombay, and to be inserted in the annual report of the medical history of the regiment. 4. When it is necessary to establish a field hospital, a surgeon is selected, from his experience generally, and is nominated in general orders, with as many assistant-surgeons under him as may be required. The field surgeon, in concert with the superintending surgeon, makes the requisite arrangements for medical stores, commissariat supplies, and sick carriage. The rules on this subject will be found in section xi., Medical Code. During the campaign in Central India the dooly was the best, and by far the most comfortable means of carrying wounded men. The next in point of convenience was the new pattern iron kajawak on a camel, and the last, the ambulance or spring cart, which was slow and not suited for forced marches, or for operations in a hilly or jungly country. The number of dooly bearers in an European regiment might, perhaps, be slightly reduced and replaced by kajanahs, but the former can never be dispensed with in this country.

XI. STATISTICS OF SICKNESS AND MORTALITY. KOLAPORE.—EUROPEAN TROOPS.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1857-58	Detachment H.M.'s 3rd Dragoon Guards. Detachment H.M.'s 33rd Regiment.	173	1	—	3	—	1	—	1	—	14	—	—	—	—	—	49	—	69	—	39·8	—
	European Troops in the Indian Army.																					
1850-51	3rd Company 1st Battalion Artillery.	101	295	4	—	—	—	—	—	—	23	1	4	1	—	—	100	7	422	4	417·8	3·9
1857-58	Detachment 4th Troop Horse Brigade. 3rd Company Reserve Artillery. Detachment 2nd European Regiment.	182	107	—	—	—	8	—	7	—	29	2	6	—	—	—	131	—	288	2	158·2	1·1
1858-59	3rd Company Reserve Artillery. Detachment 2nd Regiment European Light Infantry.	430	146	1	1	—	15	1	12	—	83	6	15	—	—	—	352	1	624	9	145·1	2·1

NATIVE TROOPS.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1850-51	17th Regiment Native Infantry. 19th Regiment Native Infantry.	994	298	3	—	—	15	1	4	1	51	2	8	—	—	—	337	1	713	8	71·7	0·8
1851-52	5th Company 3rd Battalion Artillery. 19th Regiment Native Infantry.	1,004	719	3	1	—	19	1	2	—	31	—	9	3	3	2	339	1	1,123	10	111·8	0·9
1852-53	5th Company 3rd Battalion Artillery. 19th Regiment Native Infantry.	918	375	2	—	—	18	—	8	1	32	—	7	1	—	—	327	2	767	6	83·5	0·6
1853-54	5th Company 3rd Battalion Artillery. 19th Regiment Native Infantry.	733	178	1	1	—	26	2	—	—	44	2	4	1	—	—	296	4	549	10	74·8	1·3
1854-55	5th Company 3rd Battalion Artillery. 6th Company 4th Battalion Artillery. 27th Regiment Native Infantry.	851	404	6	7	—	13	—	5	—	79	2	6	—	125	51	406	1	1,045	60	122·7	7·0
1855-56	6th Company 4th Battalion Artillery. 27th Regiment Native Infantry.	803	194	—	9	—	8	—	1	—	59	2	8	—	—	—	440	1	719	3	89·5	0·3
1856-57	6th Company 4th Battalion Artillery. 27th Regiment Native Infantry.	663	124	—	15	—	12	1	1	—	41	—	10	—	—	—	282	2	485	3	73·1	0·4
1857-58	27th Regiment Native Infantry.	599	94	1	26	—	8	1	1	—	49	—	10	—	—	—	215	—	403	2	67·2	0·3
1858-59	27th Regiment Native Infantry. 15th Regiment Native Infantry. Detachment Southern Mahratta Irregular Horse.	560	152	2	9	—	9	1	—	—	27	—	5	—	15	5	229	1	446	9	79·6	1·6

By order of the Acting Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department, Bombay, 9th November 1860.

W. C. COLES, Assistant-Surgeon, Secretary.

References to Subjects and Queries.	Replies.
XII. HOSPITALS.	1, 2. The hospitals occupied by the European troops face S.W. by S., and are about half a mile from the barracks and stables. The sudder bazaar is about 350 yards distant on the north of the hospitals. The site is open and freely ventilated, the ground being the highest in the immediate neighbourhood, and almost the highest in camp. The site is generally healthy. 3. There are wells of excellent water in the vicinity of the hospitals, which are generally sufficient. In the hot weather the supply for troops in camp is apt to become somewhat short before the setting in of the monsoon. 4. No system of drainage exists. The refuse water runs off, and is either evaporated or absorbed. Impurities from the necessary run into a cesspool, from which they are removed by the hospital sweepers. 5. The average height of the floor of the Artillery hospital above the surface of the ground is about 3 feet, and that of the European Infantry is about 5 feet. There is no ventilation underneath the floors. The roof water is partly absorbed, but a good deal runs off from the slope of the ground on which the hospital is built. No system of drainage or gutterage exists, the natural slope of the ground being sufficient to carry away any rain water rapidly. The walls of the hospital are of stone and lime, plastered with lime inside, and pointed with lime outside. The walls are single, 2 feet in thickness. The roof consists of a double layer of semi-cylindrical tiles, with bamboo matting below. Both roof and walls are considered sufficiently thick to keep the hospitals cool. The hospitals have a verandah 10 feet wide all round; the front and rear of it are open, but the ends are built up, forming dispensary and store-rooms, &c. The front is moreover protected by a second verandah of bamboo matting, which affords sufficient shelter from the sun's rays. The verandahs are never used for the accommodation of sick, convalescents, or others, excepting in an extreme case perhaps, from want of room. The hospital consists of one flat, the basement story. Table of hospital accommodation. Date of construction, 1854-5. Total number of wards, 3, one in each hospital. Total regulation number of beds.—About 48 in the European wards, and 60 in the Native Infantry hospital.

Wards or Hospital Huts. No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patients Bed above the floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.				Ft. in.		Ft. in.	Ft. in.
Wing of H. M. 83rd Regiment, 1	32	96	22	16	33,792	1,056	66	1 6	14	4 6	3 0
3rd Company 3rd Battalion Artillery Hospital, 1.	16	50	22	16	17,600	1,100	69	1 6	8	4 6	3 0
10th Regiment Bombay Native Infantry,* 1.	60	176	20½	9	32,472	541	60	1 6	16 2	4 0 3 0	3 0 2 6

* This was originally a gun-shed, and was recently occupied by the commissariat department as cattle-shed. It was lately converted into a hospital to accommodate the sick of the 10th Native Infantry, as they were exposed in tents at the beginning of the monsoon.

KOLAPORE. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The hospitals are so placed as to exclude the north-easterly winds, and to receive the benefit of the sea breeze as much as possible without being exposed to the south-west monsoon. The windows are made in two halves, opening from the centre inwards in the usual manner.
	6, 7, 8. In the European Infantry hospital ventilation is effected by three large iron ventilators in the roof, in the shape of revolving cowls, which, with the windows and doors, are sufficient to keep the wards free from odour or closeness. As these openings are always turned from the wind they do not admit cool air freely, though they allow of the exit of heated air. During the heavy rains, moreover, the rain beats in and renders the wards so damp that it is necessary to use charcoal in the monsoon to keep it dry. In the Artillery hospital there are two ventilators of the same description. There are no jhilmils. There are no other means employed for cooling the air admitted into wards, or warming them, than those already described. The walls and ceilings of hospital wards are cleansed and limewashed as a general rule every three months inside, and once outside annually, or oftener if necessary.
	9. There are two large necessaries in the rear of hospital under one roof, 8 feet high, connected with the wards by covered passages. They are divided by a partition wall inside; one is 30 × 12, the other is 25 × 12 feet. The walls are of stone and lime, 2 feet in thickness, with single tiled roof and roughly paved stone floor. All fluid excreta run into a cesspool behind them; all other impurities are removed by the sweepers. As the privies are cleaned out regularly, and lime daily employed for deodorizing, they are not offensive.
	10. In the 3rd company 3rd battalion Artillery the lavatory arrangements for the hospital are: 1 large bathing tub, 1 slipper bath, and basins at the rate of 1 to every 100 men. In the detachment 56th Regiment, 1 tub, and basins at the before-mentioned rate. This proportion is insufficient.
	11. There are no regular bath rooms attached to the hospitals. This is owing to the fact that the European troops now occupy the hospitals which were built for the native troops stationed here. It is understood that a site has been selected for a new hospital for the Europeans nearer the braracks.
	12. Washing and drying hospital linen, &c., are performed at a distance by hospital washermen in this country.
	13. Storage is very limited.
	14. The cots used in hospital consist of strong wooden frames with cotton tape stretched across them. The bedding consists of straw mattrass, $6\frac{1}{2}$ by $3\frac{1}{2}$, at the rate of 20 per cent. of the strength; pillow cases are of the same description, $2\frac{1}{2}$ feet by 15 inches, at the rate of 60 per cent. of the strength; cotton sheets, $7\frac{1}{2} \times 4\frac{1}{2}$ feet, at 60 per cent.; bedding quilts, gingham lined, with soft country blankets of the same size as sheets, at the rate of 30 per cent. Lately suttringees or bed carpets, $5\frac{1}{2}$ by $2\frac{1}{2}$, have been sanctioned in addition to the above. It would be advisable to substitute in all hospitals and barracks strong iron cots, painted, which would be more durable and economical, and certainly much cleaner than wooden ones, which are greatly disliked by the men from their speedily becoming infested with bugs.
	15. The cooking of the hospital diets is properly done, as far as the means at disposal permit. The apparatus for cooking, however, is insufficient; additional kettles being required and camp ovens for roasting.
	16. Diet tables, rolls, &c., according to regulations.
	17. In the detachment 56th Regiment no hospital orderly is allowed for attendance on the sick. It is evidently desirable to have a steady non-commissioned officer nominated for this duty in all hospitals, whether of a wing or only a detachment of two companies. A matron is sanctioned only for a complete battalion of artillery or infantry.
	18. The sanitary condition of the hospitals is good. The wards have been free from hospital gangrene, pyæmia, &c., from its free ventilation and excellent site.
	19. There are no sanitary defects calling for especial notice. It would be an improvement to have a small cylindrical drain with a sufficient fall to carry the fluid impurities a greater distance from the hospital than at present. This could be flushed regularly daily. But the chief and most important alteration that is necessary is the introduction of the dry system of conservancy in barracks and hospitals.
	20. When convalescents are too reduced to take exercise they are sent out for air in a doolie. In special cases in the Artillery permission is obtained to have exercise on horseback. There are no shaded walks or seats set apart for their use.
	21. At present there is special provision made for the treatment of soldiers' sick wives and children; they are attended in the married people's lines. These arrangements are temporary. A new hospital is required for the European troops, for whom the present accommodation would be insufficient in the event of much sickness occurring amongst them. A female hospital also is much needed for the treatment of sick women and children.
	22. There are no special local hospital regulations not included in the general Presidency Regulations.
	23. In reference to the powers of the medical officer as to repairs, &c., he can bring to the notice of the commanding officer any repairs required through the adjutant of the regiment, and he can have the hospital whitewashed on indent countersigned hy the superintending surgeon of the division. With regard to medical comforts, he has discretionary powers, restricting himself to the scale laid down. But his powers are rigidly circumscribed, and almost entirely confined to hospital details, his practice being strictly reviewed and expenditure controlled by the superintending surgeon of the division, while the commanding officer is authorized to see that order, regularity, and discipline prevail in the regimental hospital. The course pursued by Lieut.-General Sir Hugh Rose in Central India towards the medical department seems more likely to encourage zeal, to foster *esprit de corps*, and to stimulate to increased exertion, than frequent interference with executive medical officers. He is reported to have said, "I never interfere with you, and only wish to interfere when "you require my assistance to carry out your arrangements."
	24. There are no convalescent wards. In the event of much sickness occurring among the troops such an accommodation would be an advantage.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1. The burial-ground for British troops is about a mile from the station, bearing south-easterly and to the leeward of the camp. 2. Its area is about 200 feet square, and it is surrounded by a wall 8 feet high. The soil on the east side is black, but on the west this gives place to moorum, so compact that it is difficult to excavate. There is no subsoil drainage. The surface drainage is effected by means of openings left in the plinth of the wall. 3. The burials have been so few that it has not been found necessary to make any regulations as to the space allowed for each grave. The interval between each grave depends on the season, whether it is wet or dry. In the monsoon the sides of newly-dug graves fall in so much that a much larger interval must be allowed than in the dry season. The depth of the graves is never less than 4 feet, and in the dry season it is greater. During the rains a greater depth cannot be obtained in the lower part of the graveyard on account of the water. Hitherto there has been no necessity for reopening graves, nor, according to the rate of mortality since the inclosure of the graveyard, is such a necessity likely to arise for many years. The time of interment in the case of soldiers depends a good deal on the recommendation of the regimental surgeon, and in the cases of others on the wishes of the friends of the deceased. 4. The graveyard was slightly offensive last year during the time that cholera prevailed. The cause of its becoming so was attributed to the burial of native Roman Catholics without coffins. No measures were taken in the matter, as the nuisance did not extend beyond the walls, and the situation of the graveyard with respect to the camp rendered such measures unnecessary at that time of the year, when the wind blew directly from the camp to the graveyard. There are no local regulations for the burial of British troops. They are buried according to the custom of the service. 5. The bodies of Mahomedans and certain classes of Hindoos are buried in a place set apart for that purpose. The burial-ground is situated to the north, and about half a mile from the lines of the 10th Regiment Native Infantry. No houses are near to the burial-ground except one or two bungalows, which are about a quarter of a mile from it. The bodies of the other classes of Hindoos are burnt in the river. 6. No injury to the public health has resulted from the present practice, as the ground seems to have been well selected. It is desirable that the bodies should be interred sufficiently deep. The inhabitants have, up to the present time, been in the practice of digging about 5 feet deep, but in many cases much less. 7. The only improvement in the European burial-ground would be, as far as practicable, to have the bodies buried in coffins.

(Signed) J. S. Gell, Major, 10th Regiment N. I.,
Commanding at Kolapore.
T. Murray, Assistant Surgeon,
10th Regiment Native Infantry.
W. R. Dickinson, Captain, Executive Engineer,
Belgaum and Kolapore.

15th August 1860.

APPENDIX.

Cantonments and Quarters.

Separate General Orders, par. 11.

The preservation of cleanliness is of the first importance, and to this end the encroachment of huts or shops, temporary or otherwise, beyond the space already marked out for the purpose, or extending enclosures or court-yards without the sanction of Government, is to be particularly prevented.

11. All persons residing within military cantonments are required to keep all drains and water channels in and about their premises free from obstruction; to remove all causes of malaria, to keep their hedges, inner and outer, cut to the height of 4 feet from the level of the ground, and not more than 2 feet in breadth, and branches of trees lopped off to the height of 6 feet from the ground.

38. Commanding officers of regiments are to be held responsible that the above regulations are observed within the lines of their respective corps. The work is to be performed under the immediate superintendence of the Regimental Quartermaster, and without expense to the State.

41. The Cantonment Staff Officer is responsible for the general cleanliness of camp. He will procure such assistance of carts, bullocks, sweepers, &c., as may be necessary, and prefer charges for the whole expense in contingent bills.

47. The Line or Staff Serjeant of each cantonment is daily to inspect a portion thereof, so that in the course of one week every portion shall be visited by him, and to report daily to the Cantonment Staff Officer as concerns all subjects embraced in existing orders relative to cleanliness, good order, and the removal of all preventible causes of malaria.

48. The Station Staff Officer is himself to make a similar inspection weekly, and to report in writing to the Commanding Officer, who is to take immediate measures to correct what may be wrong.

49. These reports, with memoranda of measures adopted or required to check irregularities and remedy defects, are to be sent on the first of each month to the Assistant Quartermaster-General of Division, for the information of the General Officer commanding.

BELGAUM.
BOMBAY.

BELGAUM.

Accommodation { Queen's Troops - { Artillery, 1 Company, with Light Field Battery attached. / Infantry, 1½ Regiments. } / Native Troops - Infantry, 2 Regiments. }

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The surrounding country is bare and somewhat exposed, undulating in the immediate neighbourhood of the station; hills and mountains at a distance varying from 5 to 30 miles, with intervening valleys. There is not much wood, jungle, or water in the vicinity of the station. 2. The elevation of the station above the sea is from 2,100 to 2,260 feet. It is on a level with the adjacent country, and 20 to 100 feet above the nearest water. There is no higher or healthier ground adjoining the station. 3. The nearest hills are about 8 miles distant, and the nearest hill with table land about 30 miles distant. The height of the latter is about 650 feet above the station. 4. A small nullah runs through the camp, and there is also a large tank close to the fort; both are dry during the hot season. The nearest river is 16 miles distant. The vicinity is not liable to an overflow of water. There are a few ravines and water pits near the station, but they do not appear to have affected the general health of the troops. 5. The station is open, although there are some trees adjacent; but with the exception of the fort, which is somewhat shut in, there is free circulation of air throughout the camp. The temperature of the station is not raised by reflected sun heat; it is exposed to both land and sea breezes. The land winds of the cold season injuriously affect the health of the troops; the sea breezes, however, are beneficial. 6. The higher tracts close around are uncultivated; the lower land is all cultivated; their extent is perhaps the same. The large tank near the fort is an irrigation work, and several of the wells may be said to be the same, as fields are irrigated from them. Artificial irrigation has no effect on the health of the station, it is so very limited. The cultivation of rice is not prohibited. No indigo is cultivated, nor is the preparation of hemp or flax carried on near the station. 7. Shahpoor is distant about half a mile from the station, and the town of Belgaum is between the fort and the camp; the latter, it is said, numbers some 18,000 inhabitants. 8. The ground of the district is undulating, its geological structure is trap and laterite here and there cropping out. The general surface of the higher ground is composed of laterite detritus, that of the valleys is composed of negur or black soil. The camp is on new ground, but the fort, which is also included in the camp limits, is supposed to be 600 years old. 9. Water is found during the dry season from 10 to 70 feet below the surface, according to the site of the well. The difference in depth between the dry and rainy season varies to the extent of 47 feet. 10. The greater part of the rain-fall flows very readily away; on the lower ground some sinks into the soil, but much of it lies on the surface until it evaporates. There is no higher ground the drainage from which passes into the subsoil of the station. 11. The water supply of the station is derived from wells; there are no tanks for the water supply of the station. The wells are liable to pollution, both from leaves and other matter falling into them, and yearly cleansing is desirable. No nuisance or malaria proceeds from any tanks within or without the station. 12. In camp the supply of water is somewhat defective, owing to the wells being at a distance. The water is good, and has no unpleasant taste or smell. Indications of the presence of chlorides are found when chemically tested, also of sulphates of lime or magnesia, or both; carbonic acid is also present, and probably a salt of iron. It has not been microscopically examined, but it is clear from taste and smell, soft, good, and not injurious. The supply in camp is rather limited; the water is raised in leather moats (skins) by bullocks and emptied into troughs, and thence conveyed by water carriers. More wells might be sunk, or tanks might be built, to improve the water supply. 13. We can suggest no other topographical points bearing on the health of the station not included the previous answers. 14. New stations are sometimes selected by a commanding officer, but we believe more generally by a committee, of which the commanding officer, the senior officers of the medical, engineer, and quartermaster-general's departments are members. Elevated ground appears to have been generally preferred. We recommend that officers should be specially selected to determine so important a question, and that time, opportunity, and every facility should be afforded them of forming a proper opinion. We would also strongly recommend that no barrack or hospital be built till the climate of the station at which it may be intended to erect it may have been duly considered and the plans have been approved of by officers competent to judge, as the climate at different stations varies greatly, and the same kind of barrack or hospital will not suit for all.
II. CLIMATE.	1. The means and instruments available at the station for conducting and registering meteorological observations are— Anenometer - - - - - - 1 Pluviometer - - - - - - 2 Barometer, standard - - - - - 1 ,, mountain - - - - - 1 Hygrometers, Daniell's - - - - - 2 ,, Regnault's - - - - - 1 Thermometer, standard air - - - - 2 ,, ,, wet bulb - - - 2

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	Self-registering: Maximum in air (bulbs protected) - - - 1; ,, in sun's rays (bulb exposed) - - - 2; ,, wet bulb - - - - 1; Minimum in air (bulbs protected) - - - 2; ,, in grass (bulbs exposed) - - - - 1; ,, wet bulb - - - - - 1; Clock - - - - - - - 1

2. Meteorological table from 1856 to 1859.

Months.	Barometer Mean, at 9½ a.m.	Mean Temperature at 9½ a.m.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Dew, Wind, Storms, &c.
	a	*a*	*a*	*b*	*b*	*b*	*b*	*c*	*b*	*b*	*b*	*b*	
Jan. -	27·520	71·87	28·47	85·10	56·63	73·06	61·53	113·7	—	S.E.	0·85	12	Clear or light clouds, light dews, moderate winds, no storms.
Feb. -	·499	74·74	31·82	90·45	58·63	78·29	62·37	118·9	—	N.E.	0·66	19	Clear, light dews, winds sometimes strong, no storms, occasional clouds of dust.
March -	·440	77·76	32·50	94·33	61·83	80·52	66·72	119·0	0·56	S.W.	0·66	12	Light clouds, mornings hazy, weather sultry, dews sometimes heavy, wind moderate.
April -	·400	81·06	30·85	96·50	65·65	82·21	68·70	114·4	2·37	W.	0·69	11	Often cloudy, occasionally close and sultry, and a storm about the end of month.
May -	·337	78·02	22·92	89·26	66·34	79·04	70·59	114·5	6·25	W.	0·76	8	Cloudy, close, thunder, lightning, and occasional storms.
June -	·277	74·95	15·19	80·89	65·70	75·03	70·98	92·3	8·90	W.	1·25	none	Cloudy, stormy, much thunder and lightning, often hazy in the morning.
July -	·263	72·98	12·60	78·69	66·09	73·13	70·40	88·9	15·80	W.	1·15	none	Cloudy, moderate winds, occasional storms, with thunde and lightning.
August -	·315	72·43	13·14	77·87	64·73	71·93	69·24	84·5	9·40	W.	1·35	none	Cloudy, wind often high, electric disturbances unfrequent.
Sept. -	·361	74·26	16·33	80·31	63·98	72·90	69·03	96·2	3·26	W.	0·87	2	Cloudy, mists, wind sometimes stormy, few electric disturb ances.
October	·401	73·48	22·54	84·95	62·41	75·06	77·39	111·5	6·30	E. & E.	1·00	6	Cloudy, mists, occasional storms, with thunder and lightning.
Nov. -	·451	72·31	21·95	83·45	61·50	75·15	67·10	104·4	2·31	S.E.	1·08	8	Sometimes cloudy, but generally clear mornings, mists, dews, wind moderate.
Dec. -	·517	70·37	26·02	82·63	56·61	72·22	61·75	111·4	—	E. & N.E.	0·92	11	Settled weather, dews, wind moderate, occasional clouds.

a, for four years; *b*, for two years; *c*, for one year.

3. The climate is generally good, there is no excess in either dryness, moisture, heat, cold, fog, or damp, but it is variable. The trees growing in the station affect the climate beneficially. The irrigation in the neighbourhood is not injurious. Dust storms occasionally occur in the hot season, but do not affect the salubrity of the air. The general influence of the climate on health is good. During the cold and rainy seasons warmer clothing is required, and places to live in that are roomy, well-ventilated, and easily kept dry. Duties cannot be avoided, but drill and exercises should be avoided, so far as possible, from the middle of June to the end of August, on account of the ground being wet. Drills should take place generally in the morning, but during the monsoon the evening is preferable. The healthy and unhealthy months vary somewhat in different years; but for a period of 8 years the most healthy months for the European soldiers were January, February, September, August, October, and July; and the most unhealthy, May, June, March, November, April, December, and in the order stated. For the natives the healthy months were January, September, August, February, October, March, and the unhealthy, April, May, June, July, November, and December, and in the order given. The healthy season may however be stated to be from the beginning of August to the end of February, and the unhealthy from the beginning of March to the end of July, as it is during these months that epidemics usually prevail. During the unhealthy months the prevailing diseases are fever, intermittent principally, but also remittent and continued, affections of the stomach and bowels, and hepatic diseases; there are also occasional outbreaks of cholera, small-pox, and measles.

4. Not aware of any district near the station, the climate of which is more conducive to health than that of the station.

BELGAUM. BOMBAY.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	5. I have served at Sattara, Poona, Bhewady, Bombay, Surat, Mulligaum, Rajcote, Ahmedabad, Deesa, Kurrachee, Hyderabad (Sinde), Sukkur, Quettah, Kelat, Ahmednuggur (Deccan,) and Belgaum; of these Bombay and Upper Sinde are the worst, and Belgaum, Poona, and Ahmednuggur the best, but with common precautions troops might be stationed at any of them.
III. SANITARY CONDITION OF STATION.	1, 2, 3. A general map of the station and adjacent country; a plan of the station itself, and a ground plan of the barracks are transmitted. 4. Table of barrack accommodation. Date of construction: { 12 European barracks in camp, 1837 to 1842. Old artillery barrack in the Fort, 1829; new artillery barrack in Fort; 1859–60. Total number of rooms or huts, 14 barrack rooms and 60 end or verandah rooms, comprising 52 quarters for non-commissioned officers. Total regulation number of non-commissioned officers and men, 52 non-commissioned officers and (*a*) 932 men.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Inches.		Ft. In.	Ft.
9 Infantry Barracks in Camp, each.	*a* 72	193½	22	*b* 13¾	58,534	813	59	18	28	5 0	4
3 Infantry Barracks in Camp, each.	*a* 70	192	24	*b* 18¾	86,400	1,234	66	„	24	6 10	4
Old Artillery Barrack in Fort.	*a* 36	106⅙	30⅚	*c* 12	*d* 38,475	1,068	89	„	11	5 0	4
New Artillery Barrack in Fort.	*a* 38	110	24	*b* 20 7/12	54,340	1,430	69½	„	19	5 0	4
9 Barracks, 72 men in each.	648										
3 Barracks, 70 men in each.	210										
Old Artillery Barrack.	36										
New Artillery Barrack.	38										
Total -	*a* 932*										
Guard Rooms.†										Feet.	
One of the Infantry Quarter Guards, European.	*e* 17	40	18	*b* 16	11,520	642	42	18	3	5	3
One of the Infantry Quarter Guards, Native.	*e* 17	36½	20	*b* 11	8,030	472	43	on the ground.	2	5	3½
Jail Guard, Native -	*e* 20	20	15	*c* 12½	3,750	187	15	Do.	2	5	3
Fort Main Gate, European.	*e* 12	36½	16	*c* 11	6,424	535	49	18	2	4½	3½
Arsenal Guard, European.	*e* 8	20	16	13	4,160	520	40	18	2	5	4½
European Infantry Hospital Guard.	*e* 7	17	17	*c* 10	2,890	413	41	18	3	5	4
Prison Cells.											
20 Cells under separate roofs, each.	1	10	10	*f* 11	1,100	1,100	100	18	1	2	2¼
6 Cells under 1 roof, each.	1	12	8	13	1,248	1,248	96	18	2	2	7½

N.B.—*a* The number of men is calculated at 5 running feet along each wall inside per man, excluding doors.
b Height under the tie beams. } The roofs are open to the ridge; no ceilings.
c Height of side walls inside. }
d Spaces taken up by the pillars have been deducted.
e The usual strength of these Guards.
f This is the height to the plank ceiling, which has an air hole in its centre; and above it, the walls are carried 3 feet, having in each of its four sides, between the ceiling and the roof, a circular ventilating hole 1½ feet in diameter.

* The sepoys' huts are of native construction; a number built end on constitute a "pendall," which is of various lengths. It will average, say, 20 to 22 feet broad, 5 feet high at the sides, and 11 at the ridge. The interior being partitioned off with wattle and daub into separate cabins, giving, perhaps, an average of 80 to 100 square feet to each man; one small door, about 3 by 4, is all that admits light and air into each den. The pendall is usually single-tiled.

† There are other guards of less strength; but it is, perhaps, not intended to insert all.

5. The windows are on opposite sides and open inwards. Every barrack has a verandah on both sides extending its whole length. In one artillery barrack it is 8⅓ feet broad, in the other 12 feet. In 9 of the infantry barracks it is 10 feet 7 inches broad. In the remaining 3 the inclosed verandah is 9½ feet in the clear.

The verandahs are occasionally used as sleeping quarters in the hot weather. Three

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	of the infantry and one artillery have the front verandah enclosed by Venetians and glass—the rest are open. 6. The bedsteads used in barracks are boards and iron trestles. The bedding consists of coverlids, sheets, bolsters, and cotton mattresses in barracks, and the same are used while marching or on field service, minus the boards and trestles. 7. There are six descriptions of tents in use in the Bombay army. All are made of a cotton cloth manufactured in this country called durgaree.

——	Size.	Inner Walls, Number of Cloths.	Outer Walls, Number of Cloths.	Inner Top, Number of Cloths.	Outer Top, Number of Cloths.	Number of Men to each Tent.	Cubic Space to each Man.	Superficial Area per Man.
	Feet.						Feet.	Feet.
European Soldiers, single-poled tent - -	15 ×15	0	3	3	3	13	137	$17\frac{1}{4}$
„ „ double „ - -	22 ×$15\frac{1}{4}$	0	3	3	3	22	116	$15\frac{1}{4}$
Native Soldiers, single-poled tent - -	$14\frac{1}{2}$ diam.	0	0	0	3	22	$30\frac{1}{2}$	$7\frac{1}{2}$
„ „ double „ - -	$14\frac{2}{3}$×$24\frac{2}{3}$	0	0	0	3	30	65	7
European Hospital, single-poled tents - -	24 ×$15\frac{1}{2}$	3	3	3	3	20	$168\frac{1}{4}$	$18\frac{3}{4}$
Staff Serjeants, single-poled tent - -	10 ×10	0	3	3	3	6	$122\frac{1}{4}$	$16\frac{1}{2}$

8. The barracks and guard rooms have small ventilators on the ridge. Tents and sepoy huts are not ventilated. The ventilation is sufficient for the purification of the air whenever they are not crowded. There are no means of cooling the air of the barrack rooms.

9. The walls of the barracks are built of laterite and lime, doors and windows, plank shutters, and the roof is double-tiled. The tents are constructed of durgaree cloth. Huts have mud walls and single-tiled roofs.

10. The barrack rooms are paved with stone; the floors are raised to various heights from 0 to 8 feet, according to the fall of the ground. They are solid, with no passage of air underneath.

11. The materials used in the construction of the barracks, huts, and tents are suitable for the climate. We would recommend that the floors should be planked, and if the barracks were more lofty, and had a continuous ventilation along the ridge, it would increase their salubrity. The barracks and cantonment roads are repaired by the department of public works, and repairs are quickly executed. The officer commanding the station is answerable for the sanitary state of the cantonment. The walls and ceilings of barracks are cleansed and whitewashed at no stated intervals, but whenever the commanding officer of the troops occupying the barrack consider they require it.

12. There are one or more washing rooms to each barrack. The water is kept in casks filled by the water carriers, from which the men help themselves. The artillery have one plunge bath in the fort, and the infantry two in the camp. They are supplied with water raised by bullocks from adjoining wells. The water is let off through a hole in the bottom of the bath, from which a drain leads to the lower ground, where it runs to waste. The artillery can use their waste water in their gardens, if they choose.

13. A cooking range extends the whole length of the barrack cook rooms, and is topped by a number of small cooking places, open to the front and top, and of a sufficient size for a camp kettle to rest on. The fuel used is wood. There is also an oven in each cook room. Men from Goa are employed as cooks, paid by the soldiers. Water is supplied by carriers, and the drainage is led into the adjoining cesspool, which is emptied whenever necessary. There are no conveniences for washing and drying linen, nor are they necessary, the work being done by washermen generally beyond the cantonment limits.

14. The solid matter is removed from the privies daily by sweepers, the liquid finds its way into cesspools, which are cleared out whenever necessary.

15. The barracks are ventilated by the doors and windows, and ventilators in the roof. At night they are lighted by 3 lamps in each barrack. The washing places are ventilated by loopholes in the walls, the privies by doors and holes. The cook rooms are open in front, and have loopholes in the walls, and a portion of their roofs is raised. The urinals are attached and under the same roof as the barracks. None of the above subsidiary buildings are lighted at night.

16. The cesspools are cleaned out by sweepers as often as required. The drainage is sufficient, but some of the drains open too near the barracks. There is no dampness in any of the buildings beyond that caused by the weather in the monsoon. There are no foul ditches.

17. The surface cleansing is for the most part daily and efficiently done; some is burnt and the rest removed and used as manure.

18. The surface of the cantonment is kept free from vegetation. There are no old walls, &c. interfering with the ventilation of the station, bazaar, &c.

19. The bazaar is well drained. Its ventilation, as in all station bazaars, is deficient; the houses being low and crowded. The water supply is good, and there is no want of cleanliness. There are sweepers and scavenger carts to carry away rubbish and burn it. There are public privies and cesspools, but the better classes have privies near their houses, and they pay for sweepers to keep them clean, but at times they are very offensive. The bazaar is too crowded. Houses should be pulled down and the streets widened. The native houses near the station are generally low, mean, and dirty looking, there are dung-heaps and cesspits near them as well as within the enclosures. No nuisance is experienced in barracks by the wind blowing over the native dwellings, but only because they are at a distance.

The native town affects the general health of the station from bad conservancy.

BELGAUM.
BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	20. Animals have hitherto been slaughtered within bazaar limits, and the offal has been carried away about a mile and a half beyond the camp limits. Very little nuisance is experienced, but a more distant place for the purpose would be better, and one has lately been selected.
	21. The bazaar horses, buffaloes, and other cattle are kept on the owners' premises. All the manure is carted away, except the cow-dung, which is kept for fuel.
	22. In constructing the stables, the roof has been carried up to a greater height along the centre of the stable. The spaces between the upper and lower roof and the pillars that support the former, being open, thorough ventilation is secured, assisted by the large entrances at either end, which also admit a sufficiency of light. The stables are outside the Fort, and away from any barracks or hospital. The dung-heaps are in the first instance near the stables, but are afterwards sold for manure. There are no picketing grounds.
	23. There are not sufficient quarters for married non-commissioned officers and men. Some of the end verandah rooms are occupied by married men; they are separated from the unmarried.
Officers' Quarters.	1. There are no public quarters for officers. They occupy private hired bungalows, which are generally well ventilated and drained.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining native population are generally healthy.
	2. Intermittent fevers, bowel complaints, ulcers, and affections of the air passages are the prevalent diseases among natives. Diseases of the spleen are not very frequent. Cholera and small-pox are often epidemic.
	3. The diseases from which the natives suffer are chiefly caused by imperfect ventilation, want of personal cleanliness, as well as about their dwellings, errors in diet, and ignorance and disregard of all hygienic laws.
	4. One of the European regiments at this station was at Kurrachee from April 1859 to January 1860, their health there was not good as they were suffering from scurvy which originated at Aden, Mooltan, and Sinde. They arrived at Belgaum, 29th January 1860, and their health since has much improved. Venereal has been the chief disease among them since arriving. The other regiment was at Nusserabad for 2½ years, and left it on the 17th February 1860. Their general health was good, but they lost many men from sunstroke while in pursuit of the rebels in 1858. They afterwards suffered from intermittent and remittent fevers; hepatic and abdominal affections also prevailed, and often proved fatal. They arrived at Belgaum, 16th April 1860, since which slight cases of fever and venereal affections have been the chief complaints. Of the two native regiments, one was at Aden three years; they left on the 23rd December 1857, they suffered much from scurvy, which carried off a number of men. The regiment arrived at Belgaum, 6th February 1858, in very indifferent health, and has since principally suffered from scurvy, intermittent fevers, and bowel complaints. The other regiment was nearly two years at Jhansi and the neighbourhood, they left 3rd January 1860; but while there, suffered much from intermittent fever. They arrived at Belgaum, 13th April 1860, since which bowel complaints of a mild type have been chief diseases. No part of the men's present accommodation is more unhealthy than the rest in a marked degree, but some of the European barracks are lower and not so well ventilated as the others, consequently they are not so healthy.
	5. Troops are not camped out except when epidemic disease such as cholera breaks out among them. The result is generally beneficial, and the disease soon disappears.
	6, 7, 8. No experience regarding hill stations.
	9. Troops going to hill stations are liable to head attacks, hepatic affections, and rheumatism.
	10. Warm clothing, good shelter, no night duty, plenty of exercise and recreation, and abstinence from ardent spirits, are the precautions necessary to guard against these attacks.
	11. The hot season before and after the monsoon is the season best adapted for residence in hill stations, and the shortest period to derive benefit from such residence is 7 months.
	12. Not aware that there is any period of residence beyond which injury is likely to be inflicted on the health of the troops on returning to service in the plains.
	13. The precautions necessary for protecting the health of the troops on leaving hill stations for the plains are, that they should leave in the beginning of the cool season; their marches should be easy, and encamping grounds should be carefully selected; supplies, especially water, should be good and plentiful; they should not, except it be altogether unavoidable, be brought to the plains at an unhealthy season, and above al when an epidemic prevails.
	14. Long residence on the hills and short residence on the plains is likely to be most conducive to the health of the troops. Long residence in the plains is injurious; long residence at hill stations does not benefit much. Frequent change of station plains is beneficial.
	15, 16. No experience.
	17. Not aware of any higher ground near the statien which could be advantageously occupied as a hill station.
	18. We think the laterite detritus, with rock, is as healthy for stations as any we have experience of; light sandy soil is also good; black and clayey soil is objectionable.
	19. Soldiers proceeding to India should not be under 20 years of age. They should land there in the months of November, December, or January. Troops landing in Bombay are generally quartered in the town barracks, and the men are provided with suitable bedding, &c., but as soon as arrangements can be made, if a regiment, it is sent to one

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	of the healthier stations; if recruits, they join their regiments, in either case proceeding by ordinary marches. Since the late alterations the clothing is unobjectionable. The drills are light and the duties seldom very heavy. Recruits should never be quartered, or even landed in Bombay, but be sent to Kurrachee, Poona, or some other healthy station at once. Their drills should be light, and also their clothing, exposure to the sun avoided, personal cleanliness observed, and abstinence from spirituous liquors enforced; intemperance and debauchery of every kind should be provided against as much as possible. 20. We see no objection to troops being sent direct to India, provided they arrive in the early part of the cold weather, are well looked after during the earlier periods of their residence, and are sent to a healthy station. We do not think any material benefit would be derived from a residence at an intermediate station. If possible it would be advisable to send them to a hill station, and where it cannot be done they should be sent to the coolest and most healthy station on the plains. 21. The mode of transport of troops from the port to the interior is by marching, rail, bullock-train, steamers, and country boats. As a general rule, troops should be exposed to the sun and rain as little as possible, and they should never be moved from one station to another while any epidemic prevails along the line of march, when it can be avoided. The cool season should, if possible, be always selected for moving troops. 22. Ten years is the period a British soldier should serve in India; but many think this too long, while others would extend the period to 14 years, or even more. 23. The manner of conducting the business of medical boards is generally such as to avoid conflict of opinion as regards invaliding. The present system works well, and we have no improvements to suggest. 24. Invalids should leave India for home in the months of December, January, or February, when going round the Cape. But there should be invaliding committees, and invalids should be sent home oftener than once a year.
Diseases.	1. In some regiments there are weekly inspection parades, and in others quarterly inspections, for the discovery of incipient diseases. 2. Scurvy is of rare occurrence at this station; from 1850 to 1858 inclusive, 224 were admitted with this disease, and 8 died. Of these, 25 admissions and 1 death were among the European, and the remainder among the native soldiers. They were nearly all from other stations, principally from Aden. The proportion which this disease bore to other diseases was 223 to 26,452, or 0·84 per cent. In the few instances in which it does occur at the station, it is mainly attributable to inferior or insufficient diet, owing to the restrictions natives sometimes impose upon themselves. The remedies are sufficient and nourishing food, vegetables, fruits, and other anti-scorbutics. 3. During the 9 years from 1850 to 1858, the proportion of admissions for hepatic disease, including jaundice, was 744 to 26,452, or 2·81 per cent., and of deaths 33 to 287, or 11·5 per cent. Of the admissions, 693 were Europeans, and 51 were natives; and of the deaths, 24 and 9 respectively. The principal causes of the disease are the variable nature of the climate, exposure to the sun, and intemperance, when the disease occurs by itself; but it is a very frequent concomitant of fever and dysentery, and attributable to them. The prophylactics we would recommend are regular and temperate living, suitable clothing, and careful avoidance of exposure; but the climate of the station is very unsuitable for hepatic affections, and no regiment which has suffered much from fever or bowel complaints should be sent to it, if it can be avoided. 4. Dracunculus is a very rare occurrence at this station. The total admissions during 9 years were 331, but they were nearly all from other places, such as Dharwar, Kulladhee, and Kolapore. The fact of the disease ever having been contracted at Belgaum is doubted. 5. The proportion of the constantly sick from venereal diseases to the total sick, from 1850 to 1858, was 2,943 to 26,452, or nearly 11·13 per cent. Of these, 2,542 were European, and 401 native soldiers. To the above might, there is very little doubt, be added half of 447 cases of orchitis and stricture, and at least a third of the most severe of 2,341 cases of rheumatism has been of venereal origin, as well as some cases of ophthalmia. Venereal, especially syphilitic, diseases are frequent and formidable at this station, and often seriously impair the efficiency of a regiment. The most effectual means of diminishing the liability of the soldiers to this disease, would be to allow them to marry in larger proportions than at present. Were all the loose women in or near the bazaar, whether within the military or civil limits, registered and subjected to periodical medical inspections, a lock hospital might be of use, but not otherwise. The restrictions necessary to render a lock hospital useful, hardly accord with British ideas of the liberty of the subject, and hence in a great measure their inutility hitherto, and their having been generally abolished. 6. The troops at the station suffer from the following diseases:— *Fevers.*—Intermittent, remittent, continued, and ephemeral; also eruptive fevers. *Dysentery.*—Acute and chronic. *Cholera.*—Sometimes mild, but often of a most severe type. *Small-pox.*—Mild and virulent. *Rheumatism.*—Acute and chronic, idiopathic and of syphilitic origin. The proportions of admissions and deaths from the above diseases to the total admissions and deaths were 10,359 and 102 to 26,452 and 287 respectively, or 39· per cent. of the total admissions; and 35·54 of the total deaths, during a period of 9 years. Of those admitted, 7,358 were Europeans and 3,001 natives; and of the deaths 80 and 22 respectively. To show the proportion of admissions and deaths among the Europeans compared with the native troops, it may be stated that the total strength of the former during 9 years was 9,519, and of the latter 13,437, or an average of 1057·66 of Europeans and 1493·0 Natives for each year. 7. Intermittent fevers are very tractable, and remittent and continued generally so when not complicated with hepatic, pneumonic, or cerebral affections. Measles are generally mild and seldom fatal. Small-pox is very often fatal, especially among infants.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops: *Diseases—cont.*	Chicken-pox is generally a trifling complaint. Cholera, when prevailing epidemically, is rapid in its progress, and extremely fatal. Dysentery and diarrhœa are often severe, but generally manageable if uncomplicated; but at this station hepatic affections are common concomitants. Hooping cough is generally mild, but of long duration. Erysipelas generally requires stimulant treatment. Catarrhal affections are frequently severe but seldom fatal. The hot season and the first part of the monsoon, that is, from the beginning of March to the end of July, are the seasons when such diseases are most prevalent. The climatic and atmospheric conditions which precede or accompany their appearance, are hot, close, and oppressive weather, with variable and irregular winds, and frequent calms. The sky is generally clear till about the end of March, and there are few electric disturbances, but afterwards it is more or less cloudy, and sometimes overcast, and storms, with rain, thunder, and lightning, are not infrequent, till about the middle of June, when it becomes settled monsoon weather. The sanitary condition of the station is upon the whole good. But the bazaar and native dwellings are greatly wanting in cleanliness and ventilation, as the houses are close, crowded, and confined. The water supply is very fair, both as regards quantity and quality; but the drainage is bad or very indifferent. The European troops are at present too crowded, and the natives always so. The crowded state of the native population, their want of cleanliness, both personally and in and about their dwellings, and their apathy and disregard of all sanitary measures, no doubt predispose them to disease. 8. The nature of the soldiers' duties, and occupations in barracks have very little influence on epidemic diseases, but their habits of exposing themselves to the sun, frequenting the bazaar, and their irregularities and intemperance, tend to excite disease, and to render it more severe when they are attacked by it. 9. Small doses of quinine have not been tried at this station that we are aware of, as a prophylactic against malarial diseases. 10. To prevent or mitigate epidemic disease, the troops should have more space, the Europeans in their barracks and the natives in their huts; both should be loftier and better ventilated dwellings. Every inducement should be held out to the European soldier to eschew the bazaar, and the irregularities there committed, by providing him with reading rooms, and all rational means of occupation or amusement. The conservancy of the cantonment might be improved, and in the bazaars and native population it should be far more insisted upon. If it could be done the streets should be widened, and proper ventilation in the dwellings enjoined, as well as the removal of all impurities. Vaccination should also be more generally practised.
V. INTEMPERANCE.	1. The soldiers at the station are generally temperate. The confirmed drunkards are about 1 per cent. 2. The proportion of admissions into hospital from diseases directly caused by intemperance were, last year, in one regiment, 10; in another only 4. This refers to Europeans; among the natives there was none. The admissions caused indirectly were in the case of one regiment 15; in the other regiment not known. No natives were admitted on account of intemperance. There are no available materials for the preparation of a statistical table showing the effect of abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station. Drunkenness is always punished as an offence. 3. Arrack, supplied by the commissariat, is sold in the canteens, and the quantity generally consumed is 1 dram per man a day; more than 2 drams is not allowed. It is of good quality. Distilled spirits of the worst description are sold in the bazaar, and may be had in almost any village. In the bazaar the sale should be repressed more stringently than it is. Spirit is not part of the soldiers' ration at the station, on the march, or in the field. None is issued from the canteen but what is paid for by the men. The quality of the spirit is good. No spirits are allowed before dinner, and no morning drams. Spirit is never given as a ration to convalescents. A convalescent is not allowed to enter the canteen. Drinks injurious to health, other than intoxicating drinks, are sold in the bazaar, but not in the canteen. 4. Opinions differ as to whether the consumption of spirits is conducive or injurious to health. Some would allow no spirits except under special circumstances, such as great fatigue: while others think them beneficial, or, at all events, not injurious, when used in moderation. If used in moderation it does not affect the discipline or efficiency of the corps. 5. It would be beneficial to restrict or abolish the use of spirits if it could be effectually done; but if there was no canteen the men would resort to the bazaar, and drink the bad liquor vended there. As matters stand, to abolish the use of spirituous liquors would be injurious. 6. Good malt liquors are preferable to spirits in this climate. Wine is better than spirits, but not so good as malt liquor, and its expense is too great to admit of its being used by the men. 7. Coffee, tea, lemonade, &c., are in use to a very considerable extent. Their influence is good in every respect; they tend to keep the soldier from drinking other liquors, and whatever diminishes drunkenness is beneficial to health and discipline. 8. We are not prepared to say that it would be beneficial to suppress the issue of spirits from the canteen, as the men would get liquor and of a bad quality elsewhere. 9. It would be beneficial to prohibit the sale of spirituous liquors in the canteen, and to substitute beer, coffee, &c., but to prohibit the sale of spirituous liquors there would not be advisable. 10. The present canteen regulations work well. There should be a good large canteen where the men could sit down and drink their liquor comfortably. A good coffee shop should be attached to all barracks; and the sale of liquors in the bazaar to soldiers should, if possible, be wholly prevented. 11. The canteen regulations are according to section x. 3rd Appendix, Jameson's Code. There are no regimental bazaars.

References to Subjects and Queries.	Replies.
VI. Diet.	1. The diet for Queen's British troops and European troops of the Indian army is the same at this station, and consists of— Bread - - - - - 1 lb. Tea - - - - $\frac{5}{7}$ oz. Meat - - - - - 1 lb. Sugar - - - $2\frac{1}{2}$ oz. Rice - - - - - 4 oz. Salt - - - 1 oz. Vegetables (8 oz. of these usually potatoes) 1 lb. Firewood - - 3 lb. When tea is not supplied $1\frac{1}{4}$ oz. of coffee is issued. The vegetables are the produce of the country, and vary according to the season of the year. A responsible inspection of the ration is made by corporals of companies, and by the orderly officer daily; and an inspection of them is frequently made by the commanding officers. 2. Complete rations are supplied, including vegetables, but no fruit. The stoppage is 3 annas 4 pice per day per man. There are three meals; in one regiment breakfast at 7 o'clock, dinner at noon, and tea at 4. In the other, the hours are 8 a.m., 1 p.m., and in the evening respectively. There is one pound of vegetables in each ration. 3. An improvement in the ration would be made if the quantity of rice were reduced, and the supply of vegetables or bread increased. Spices and cocoa-nuts should be added to the ration to enable the men to have currie occasionally. Mutton should be sometimes substituted for beef, which is the meat always supplied at this station. Such a thing as a soldier selling or exchanging his ration is of very rare occurrence; but part of the rice is often given to native cooks and others. Soldiers often purchase extras at their own expense. 4. The means and apparatus for cooking are the ordinary kitchen, with camp kettles, frying and stew pans, flesh forks, meat dishes, and tins. There is no cause of complaint with reference to the cleanliness, lighting, or ventilation of the kitchen, but the water supply is not so copious as might be wished. The food is cooked as the soldier wishes; besides having it boiled or roasted he may have it stewed or made into pies. There are few complaints about the cooks; considerable variety in cooking is attainable in this *country*; tea is properly prepared. A soldier pays one rupee per month for cooking. The men have tea, coffee, or other refreshment generally in the middle of the morning's march. 5. Gardens for the cultivation of vegetables could not be advantageously established for soldiers, as without the assistance of a native they would be too much exposed to the sun; and much of their time in the morning and the evening is occupied by drill, rifle practice, &c. Small plots of ground near the barracks would be useful as a recreation, but the number of men that have a taste that way is small. If they were established it should be under such regulations as the commanding officer might think necessary from time to time.
VII. Dress, Accoutrements, and Duties.	1. The component parts of a soldier's dress are:—A tunic of red cloth, a red serge frock, one pair of Oxford mixture trousers, one pair light blue cloth trousers, two suits of cotton dyed cloth called khakee, a wicker helmet with khakee cover, and a blue felt forage cap with the same kind of cover. The accoutrements are a shoulder and waist belt for carrying the ammunition and bayonet. List of necessaries for Europeans and natives, extracted from Jameson's Code, pages 32–33, section 13, Appendix. Infantry of the Line. *Europeans.* 1 forage cap with chin strap. 2 white cotton covers for ditto. 2 white cotton covers for dress cap. 4 white cotton jackets. 5 pairs white cotton trousers. 2 pairs dark blue ditto (barrack change). 4 white cotton shirts. 2 check ditto (barrack change). 3 flannel waistcoats or belts. 4 pairs cotton socks. 2 pairs worsted ditto. 4 towels. 2 pairs braces. 3 pairs shoes. 1 sleeping carpet (6 ft. by $2\frac{1}{2}$). 1 numda mattress. 2 cotton covers for mattress. 2 sheets. 1 Europe blanket or 2 kumblee blankets. 1 coir pillow. 2 cotton cases for ditto. 1 haversack. 1 jamboo, with plate and cover. 1 comb. 1 hair brush. 1 clothes brush. 2 shoe brushes. 1 razor, brush, and soap. 1 sponge. 1 button stick and brush. 1 marking stick. 1 knife, fork, and spoon. 1 holdall. 1 account book. 1 gun stopper. 1 oil rag. Blacking and pipe clay. Additional, when on field service, 1 water canteen. *Natives.* 1 Kilmarnock forage cap with chin strap. 2 white cotton covers for ditto. 1 chin chain for ditto. 2 white linen or cotton jackets. 3 pairs white linen or cotton trousers. 2 pairs black cotton ditto. 1 great coat. 2 pairs braces. 1 canvass bag. 1 clothes brush. 1 shoe brush. 1 button stick and brush. 1 marking stick. 1 gun stopper. 1 oil rag. Blacking and pipe clay. 2 pairs shoes. 2 meerzaies. 1 dhoputta ($2\frac{1}{2}$ yds. long by $2\frac{1}{2}$ ft. wide). 2 dhoties or paijamas. 2 chudders. 1 ruzzai. 1 sleeping carpet (6 ft. by $2\frac{1}{2}$). 1 haversack. *Cooking utensils.** 1 brass lota (small, $5\frac{1}{2}$ inches wide, $3\frac{1}{2}$ inches deep), and cord. 1 brass lota (large size). 1 tuvwa (iron), 9 inches wide. 1 thalee (brass), 9 inches wide and 2 inches deep. 1 kuttora (brass). 1 chimcha (brass). 1 chimta (iron). Additional, when on field service, 1 water canteen.

* Total weight not to exceed $6\frac{1}{2}$ pounds.

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*cont.*	The above equipment is sufficient and suitable. We have no improvements to suggest beyond the addition of a puggree to the Kilmarnock cap of the natives. The guard dress from sunset to 8 a.m. is a tunic and cloth trousers. By day a serge frock or khakee clothing. Guards have shelter in guard-houses, and the sentries in verandahs or sentry boxes.
Duties.	1. Recruits should be thoroughly drilled at home, and sent out direct to India without residence at an intermediate station. Some think that a recruit learns his duty best with his regiment, and that he should join it at once. 2. The usual routine of a soldier's duties are guards, roll calls, parades, and drills. Morning parades and evening drills are one hour in duration. Morning roll call at ½ past 5 a.m.; noon roll call at noon; afternoon roll call at 5 o'clock; tattoo roll call at 9 p.m. The number and duration of drills is much left to the commanding officers, who take care that they are not carried to an extent to prove injurious. Early morning is the best time for drill or march when the weather is fine. The men should be in barracks or on their encamping ground not later than an hour after sunrise. The orders are that on all ordinary occasions the marches should be "so timed as to bring them to "their ground by or soon after sunrise." The average number of nights the men have in bed during the week varies from 3 to 5 or 6, according to the strength of regiments and the amount of duty. 3. The most distant guard from the barracks is about 2 miles. All guards are for 24 hours, of which the soldier stands 8 hours on sentry, viz. 2 hours out of every 6 hours. There are day and night roll calls, but they vary very much at the discretion of the commanding officers, who avoid disturbing the men at night as much as possible. Night guards are injurious to health, and there should be as few of them as possible, and those in the most healthy position admissible. The great coat should be worn close to the body and the accoutrements outside.
VIII. INSTRUCTION AND RECREATION.	1. The means of instruction and recreation are as follows:—There is one ball court between the greater part of two European regiments and about two skittle grounds per company; there are also cricket bats and balls and quoits. There are schools with good schoolmasters, also a library, which is sufficiently lighted till tattoo. There is no day room or soldiers' clubs. There are some small gardens near the barracks cultivated by the soldiers, but from the want of water very little can be done in them except during the monsoon. One regiment has a tailors' and carpenters' shop, but there are no workshops properly so called; they are much wanted. There is no theatre or gymnasia. The means are not sufficient even for one regiment to keep the men occupied during the wet season and the heat of the day, and the greater part of two regiments are occupying the several buildings intended for one regiment only. One regiment is restricted from exposure when off duty during the hot weather from 8 a.m. to 4 p.m.; in the other there is no restriction but that the head be properly covered; the men are, however, discouraged from exposing themselves during the heat of the day. The rule observed by the latter regiment we think preferable. Too much confinement is bad. 2. Workshops should be built to encourage soldiers to practise their various trades; gymnasia should be attached to every range of barrack; each barrack should have a reading-room; also sheds for games in the hot and wet weather. To the above many would add theatres, but we think they lead to too much excitement, to be conducive either to health or discipline. The well behaved should be allowed to go out shooting and coursing. 3. Savings' banks have long been instituted. In one regiment (the 83rd), the deposits amount to 53,000 rs. 4. The only shade is from the barrack verandahs, which are not sufficient to enable the men to take exercise. Additional sheds, and the planting of small clumps of trees near the barracks, which could easily be done at this station, would conduce to the health of the men.
IX. MILITARY PRISON.	1. The cells are solitary, 10 feet square, well ventilated, and not prejudicial to health.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2. The practical working of the powers of the medical officer, as regards the conduct of the line of march of troops, bivouacking, &c., is generally good, as his recommendations are usually attended to; but often bad, as a medical officer has no power to interfere further than the commanding officer may think proper to permit. Should the worst encamping ground be chosen, and the most injurious marches made, it may not be safe for a medical officer even to make any representation on the matter, as it subjects him to censure. 3. The practical operation of camp regulations for the preservation of the health of the troops, &c., is generally satisfactory. The medical officer has no independent power; his recommendations are usually attended to from courtesy, and a desire for the welfare of the men on the part of the commanding officers; but we think on these matters, he should always be consulted, and when his advice is disregarded, commanding officers should be bound to submit their reasons to higher authority. 4. A force on taking the field is provided with tents for field hospitals, and they are so used, when houses or other better accommodation is not available. A field surgeon is appointed to take charge, with assistants and hospital establishments on the same plan as regimental hospitals; and according to the number of the sick, field hospitals are established at the most convenient stations, when from the large number of sick it may be desirable to disencumber the force of them. In the field, according to present regulations, 5 per cent. of doolies, with 6 bearers each, and 1 per cent. of spring carts, are allowed to Europeans, and 1 per cent. of doolies, and 1 spring cart to 500 natives. The doolies and carts are procured by indent on the ordnance department, and the bearers and cattle from the commissariat. Hospital supplies are carried and provided by the commissariat department. The regulations bearing on these matters are to be found in the medical codes and general orders, separate, of which the committee have not copies to spare. (See Medical Code, sec. xi., p. 123 to 129; also General Orders, separate, section Carriage.)

References to Subjects and Queries.	Replies.
XI. Statistics of Sickness and Mortality.	BELGAUM.

European Troops.

Years.	Corps.	Strength.	Fever. Treated.	Fever. Died.	Eruptive Fever. Treated.	Eruptive Fever. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1853-54	H. M.'s 64th Regiment	332	247	—	4	2	34	—	22	—	58	2	20	—	—	—	383	1	763	5	231·3	1·5
1854-55	Ditto	992	231	—	1	—	128	1	88	1	223	11	46	1	—	—	947	—	1,664	14	167·7	1·4
1855-56	Ditto	1,093	192	1	2	—	69	2	81	2	244	9	37	—	—	—	870	4	1,495	18	136·7	1·6
1856-57	Ditto	664	107	—	—	—	63	—	83	1	170	10	54	3	—	—	610	2	1,087	16	163·7	2·4
1857-58	8/14 Royal Artillery Detachment 3rd Dragoon Guards Detachment 33rd Regiment H. M.'s 56th Regiment Depôt 64th Regiment H. M.'s 86th Regiment	866	95	1	3	1	46	—	29	1	119	2	15	1	—	—	397	1	704	7	81·3	0·8
1858-59	H. M.'s 56th Regiment Depôt H. M.'s 64th Regiment	664	174	2	—	—	101	1	52	2	210	3	21	—	—	—	755	1	1,313	9	197·7	1·3
	European Troops in the Indian Army.																					
1850-51	2nd Regiment European Light Infantry. Garrison and Details	1,059	293	4	—	—	118	3	77	4	240	8	31	2	1	—	1,113	3	1,873	24	176·8	2·2
1851-52	3/1 Battalion Artillery 2nd Regiment European Light Infantry. Garrison Details	1,249	287	3	—	—	125	5	79	—	216	6	72	2	1	1	1,105	4	1,885	21	150·8	1·6
1852-53	3/1 Battalion Artillery 2nd Regiment European Light Infantry. Garrison Details	1,163	323	1	3	1	157	3	96	3	200	13	85	4	—	—	916	9	1,780	34	152·9	2·9
1853-54	3/1 Battalion Artillery 2nd Regiment European Light Infantry. Garrison Details	763	168	2	2	—	64	—	67	1	154	6	58	3	—	—	537	4	1,050	16	137·6	2·1
1854-55	3/1 Battalion Artillery Garrison Details	125	55	—	3	1	9	—	11	—	20	1	2	—	—	—	80	—	180	2	144·0	1·6
1855-56	3/1 Battalion Artillery Garrison Details	124	17	—	—	—	2	—	13	1	24	1	2	—	—	—	61	—	119	2	95·9	1·6
1856-57	3/1 Battalion Artillery Garrison Details	126	19	—	—	—	9	1	5	—	15	1	7	—	—	—	88	—	143	2	113·4	1·5
1857-58	3/1 Battalion Artillery 2nd Reg. European Lt. Infantry Garrison Details	353	471	2	4	—	19	—	11	1	76	2	24	1	—	—	274	1	879	7	249·0	1·9
1858-59	2/1 Battalion Artillery 3/1 do. do. 2nd Regiment European Light Infantry. Garrison Details	662	217	—	—	—	33	1	20	4	111	5	24	—	—	—	623	—	1,028	10	155·2	1·5

Native Troops.

1850-51	5/3 Battalion Artillery 4th Regiment Native Infantry 9th do. do. Detachment Poona Irregular Horse. Garrison Details	1,744	589	6	2	—	27	1	4	1	89	—	15	1	4	—	808	2	1,538	11	88·1	0·6
1851-52	4th Regiment Native Infantry 9th do. do. Garrison Details	1,246	245	1	9	—	40	—	3	1	70	1	19	1	6	3	552	2	944	9	75·7	0·7
1852-53	4th Regiment Native Infantry 9th do. do. Garrison Details	1,475	284	3	14	—	32	1	5	2	117	3	19	—	—	—	582	3	1,052	12	71·2	0·8
1853-54	4th Regiment Native Infantry Detachment 9th do. 20th Native Infantry 29th do. Garrison Details	1,315	286	1	16	—	23	—	5	1	95	—	26	1	1	1	502	1	954	5	72·5	0·3
1854-55	20th Regiment Native Infantry 29th do. do. Garrison Details	1,503	209	4	11	—	13	—	—	—	84	8	5	—	—	—	451	1	773	13	51·4	0·8
1855-56	20th Regiment Native Infantry 29th do. do. Garrison Details	1,318	149	2	35	—	25	—	1	—	55	1	9	1	—	—	344	2	618	6	46·8	0·4
1856-57	20th Regiment Native Infantry Detachment 28th Regiment Nativo Infantry. 29th Regiment Native Infantry Garrison Details	1,317	145	1	11	—	22	—	3	1	48	1	11	—	—	—	305	—	545	3	41·3	0·2
1857-58	15th Regiment Native Infantry 18th do. do. 20th do. do. Garrison Details	2,498	650	4	74	3	80	6	29	3	352	3	28	—	1	—	1,274	11	2,488	30	99·6	1·2
1858-59	15th Regiment Native Infantry 18th do. do. 20th do. do. 3rd Extra Battalion Garrison Details	1,790	374	2	27	—	40	3	2	—	98	3	14	—	3	1	748	1	1,306	10	72·9	0·5

By order of the Acting Principal Inspector-General, Medical Department,

W. J. Coles, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 10 October 1860.

BELGAUM. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. Ground plan and elevations of hospitals transmitted. 2. The distances of the hospitals from the barracks vary from about 200 yards in the fort to about 600 in the camp. The artillery stables are outside the fort, and about one third of a mile from the hospital. In camp there are no stables. The distance of the European hospital from the bazaar is about half a mile to the north-west, of the native hospitals about a quarter of a mile to the westward, and of the artillery hospital in the fort about a quarter of a mile to the eastward. The hospital in the fort is rather confined, from the walls of the fort, trees, and buildings; but in camp the hospitals have open sites and free ventilation. The sites of all the hospitals are, upon the whole, good, not being near any rivers, marshes, nullahs, &c., and should the ground be foul and there be nuisances, it will be from want of cleanliness. 3. The water supply is wholesome, but limited, it being all brought by water carriers. There are no means of increasing the supply, except by increasing the number of water carriers. 4. There are no sewers for removing refuse water. The rain water everywhere flows naturally away over the surface. The artillery hospital in the fort has a small cesspool attached to the cook room and close to it. The native hospitals have no artificial sewerage. The European infantry hospital in camp has cesspools attached to the privies and cook rooms, with which they communicate by small masonry slab drains. Sweepers are attached to each, who remove all solid matter daily, and the cesspools are emptied whenever necessary. 5. The height of the lowest wards above the ground varies from 2 to 6 or 7 feet. The floors are solid, and only in one ward, which is upper-storied, is there perflation of air underneath. The soil is generally porous, and part of the roof water is absorbed into it, but the greater portion is carried off by the natural drainage. There are open gutters round the hospital, which are sufficient for carrying off the water rapidly. The material of which the hospital is built is generally laterite and lime. The walls and roofs are high, but not double, and are sufficiently thick to keep the building cool. The hospitals are supplied with verandahs on both sides, of different breadths, varying from 8¼ to 9 feet. They are sufficient to afford shelter from the sun's rays. The verandahs are only used for the accommodation of the sick, convalescents and others in extreme cases, under great pressure for want of hospital accommodation. Of the hospitals at this station there is only one ward which is upper-storied.

Table of Hospital Accommodation.

Date of construction.—Hospitals of native regiments in camp, 1834. Artillery hospital in fort, 1837. Part of the European hospital in camp, wards numbered 1, 2, 3, and separate ward with the subsidiary buildings to the right of the centre dividing wall, in 1841–42. The remainder finished in 1860.

Total number of wards, 12.

Total regulation number of beds, 283.*a*.

Wards or Hospital Huts, No.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		Ft. In.	Ft. In.	Ft. In.				Inches.		Ft.	Ft.
Artillery Hospital in the Fort (one ward).	*a* 12	36 9	19 8	*b* 14	10,117	843	60	18	6	4	3
Artillery Hospital in the Fort (the other).	*a* 12	36 9	19 8	*b* 14	10,117	843	60	„	6	4	3
European Infantry Hospital, Camp, Belgaum.											
Ward No. 1	*a* 42	133 8	21 10	*b* 12 10	37,451	892	69	„	20 *c* 8	5 1¾	4 6
Ward No. 2, upper-storied.	*a* 42	134 0	22 3	*b* 13 3	39,505	940	71	„	20 *c* 8	5 1	4 6
Ward No. 3	*a* 16	51 10	22 0	*b* 12 10	14,630	914	71	„	8 *c* 6	5 1¾	4 6
Separate Ward	*a* 12	40 0	22 0	*b* 12 10	11,293	941	73	„	8	4½	4
New Male Ward	*a* 37	124 6	23 9	*b* 20 0	59,137	1,598	80	„	20	2	3
Ditto	*a* 28	98 6	23 9	*b* 20 0	44,412	1,586	79	„	16	2	3
New Female Ward	*a* 12	42 0	23 9	*b* 20 0	19,950	1,663	83	„	10	2	3
Ditto	*a* 6	21 0	23 9	*b* 20 0	9,975	1,663	83	„	6	2	3
Hospital for 1 Native Infantry Regiment.	*a* 32	96 0	22 0	*b* 12 0	25,344	792	66	„	16	5	3½
Hospital for the other	*a* 32	96 0	22 0	*b* 12 0	25,344	792*	66	„	16	5	3½
Total	*a* 283*										

a The number of beds in each ward is calculated by first excluding the doors, and then giving 6 feet from centre to centre of each bed.
b Height under the beam.
c Ventilating windows high up in the walls, half filled with wooden bars.

* N.B. Most of these calculations are according to an old scale; the rule is now to allow 1,800 cubic feet for each European and 1,100 or 1,200 for each native patient in hospital.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The artillery hospital in the fort is too much surrounded by buildings and arboreous vegetation, and the wards of the European hospital in camp are so placed relatively to each other that the full benefit of the prevailing winds is greatly interfered with as regards one of them. The windows open to the inside by halves, and are sufficient for ventilation and coolness. It might be an improvement if the portions between them and the relieving arch above were filled with Venetians, instead of being built in. 6. Beyond the ventilation in the roof and the doors and windows there is no artificial ventilation; but the above is found sufficient to keep the hospital free from odour or closeness when not overcrowded. There are no jalousies or jhilmils. 7, 8, 9. There are no means of cooling the air in the wards or of warming them. The walls are as a rule whitewashed once a quarter, but oftener if necessary. The several privies are provided with iron pans which are removed and cleaned out at least once a day. The supply of water is very limited. The cesspools are always more or less offensive, and it is exceedingly difficult to prevent them being otherwise. 10. There are no lavatory arrangements. This is a great want. 11. There are no means of bathing the sick beyond large tubs and slipper baths, except at the European hospital in camp, to which a shower bath is attached. 12. The hospital linen is washed by washermen away from the hospital, and the work is generally done satisfactorily. 13. The storage generally is sufficient and dry. 14. The bedsteads used in hospital are iron cots with cross bars; the bedding consists of mattresses stuffed with straw, and pillows stuffed with straw or hemp. Cotton sheets and woollen country blankets. There is great room for improvement in the quality and manufacture of these articles. They are supplied by contract, and are of very inferior description. 15. The several kitchens are all conveniently situated; they are ventilated by the doors and windows as well as by the roof, and they contain the means of cooking the diets in such variety as the sick require. 16. Diet tables, &c., according to regulation. 17. The following attendance is provided for the sick. There is a hospital serjeant whose duty is merely to see to the cleanliness of the hospital and its discipline. There are ward boys for attending on the sick, and also dooly bearers, sweepers to keep it clean, a matron and assistant for the female hospital, an apothecary and assistant apothecary, a compounder of medicines and dressers, and a steward for the provision and clothing department. The attendance is sufficient. The establishment of native hospitals is the same, only that they are much smaller. All the servants are native, and there is no matron. 18. As already stated, one ward is greatly shut out from the breeze. To another the privy is somewhat a nuisance. Cases of epidemic disease have appeared in the wards, but only when prevailing at the station. Sores, especially venereal, sometimes take on an erysipelatous or sloughing action, but this is believed to be attributable to the climate rather than to anything about the hospitals. 19. Some of the wards are badly placed relatively to each other; the privies and most of the outhouses are too close to the wards, and the whole are too much crowded together. One essential improvement required is, that the ward so much closed in should be made an upper-storied one, and proper lavatories should be attached to all the wards. These remarks apply to the European hospital in camp. The artillery hospital in the fort is too low and narrow. The two hospitals for natives which are in camp are too small and have no wards for infectious diseases. 20. Convalescents can walk about the compound or hospital enclosure, and go beyond it, accompanied by an orderly, morning and evening. There is not sufficient ground suitably fenced, and there are no shaded walks or seats except in the verandahs of the hospital. 21. There is a female hospital, with a suitable establishment, in which sick women and children are treated. The arrangements are satisfactory and sufficient to meet every useful purpose. 22. There are no special local hospital regulations. Everything is done according to the rules laid down in the medical code. 23. The medical officer has an establishment, and he has the power, and it is his duty to enforce cleanliness. In repairs to buildings he has no power, but through his commanding officer or superintending surgeon, or both. Any defects it is his duty to report to them. As to changes of diet, &c., his power may be said to be unlimited, but under the control of the superintending surgeon and director-general of the medical department, to whom he must always be prepared to give an account; but they seldom if ever object if the explanation of its having been required for the benefit of the sick is satisfactory. 24. There are no convalescent wards or hospital, nor would they be of any advantage.
XIII. Burial of the Dead.	1, 2. The burial ground used for British troops is within the camp limits. The land winds pass over it to the European cantonment, but at a considerable distance, and the sea breezes pass over it to the native town and fort, the latter being a long way off. Protestant burial grounds - - 1·8 Acres. Roman Catholic - - - 1·2 3· They are adjoining, with a wall between and a wall all round. The subsoil is principally decomposed laterite. It is carefully kept, and decomposition ought to be rather rapid as the ground is low and damp.

References to Subjects and Queries.	REPLIES.
XIII. Burial of the Dead—*cont.*	3. The usual dimension of a grave for an adult is 7 feet by 2½ feet. The space between graves is 2 feet. The depth depends somewhat on the soil; when it is hard or rocky, it is 6 feet; when soft, 7 or 7½ feet. Instances of re-opening graves have been very rare, and only at the special request of a near relative of the deceased. The orders of Government now forbid the same ground being used a second time. There is no specified time for interment; but it takes place within 24 hours after decease. During epidemics, if death occurs in the forenoon, interment takes place in the evening; if in the afternoon, early the following morning. As regards natives, the grave space is less, as they do not use coffins. The intervals between them are greater, as they usually bury in an open plot of ground; their depth is also less. They are not reopened, nor, as a rule, is more than one interred in the same grave. The time of interment is not compulsory, but it takes place in much the same time after death as with Europeans. 4. The grave-yard is never offensive. In cases of severe epidemics, when many bodies are interred in the same pit, it is made deeper than usual, or more earth is heaped upon it. There are no regulations with regard to the burial of British troops, but interment takes place within 24 hours after death. And under all ordinary circumstances, in the evening before sunset, or in the morning very shortly after sunrise. 5. The dead of camp followers or bazaar people are carried beyond the camp limits, and buried or burnt. 6. No injury accrues to the public from the present practice that we are aware of; but in cases of burning, the smell is sometimes unpleasant. 7. There are no objections to the present arrangements, and no improvements are suggested.

(Signed) F. T. FARRELL, Major General, Commanding Southern Division of the Army.
T. MACKENZIE, Superintending Surgeon, Southern Division of the Army.
T. WALLER, Staff and Civil Surgeon.
W. R. DICKINSON, Captain Engineers, Executive Engineer, Belgaum and Kolapore Districts.

31st July 1860.

AHMEDABAD.

Accommodation — British Troops — Artillery - 1st Company, 1st Battalion.
Infantry - Wing 4th King's Own Regiment.
Native Troops — Artillery - 3rd Battalion.
Cavalry - Part of Guzerat Irregular Horse.
Infantry - 11th and 14th Regiment N. I.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is flat and cultivated with grain and pulses, and large forest trees, but not densely planted or obstructing the wind. It is sandy and dry, when the monsoon water is drained off. There is a little wood, and a river running at the back of the camp; no jungle. 2. The elevation of the station above the sea is about 320 feet, and the adjacent country is on the same level as the camp. The nearest water is the river Saburmuttee, flowing a quarter of a mile from the camp, which is built along its left bank. There is no higher or healthier ground adjoining the station. 3. The nearest mountain is Mount Aboo, situated about 150 miles from camp, with an elevation of about 4,500 feet above the level of the sea. Powa Ghur is nearer, but is not adapted for a sanitarium. 4. The sea is about 65 miles from camp, and the river about a quarter of a mile as above stated. The district is not liable to an overflow of water, and there are no ravines or broken ground. 5. The station is open, and well exposed; there is nothing to interfere with free ventilation; and in our opinion the temperature is not raised by reflected sun heat. It is exposed to the hot and cold winds which blow from the S.W. and N.E., but they have no effect on health. 6. The surrounding country is cultivated. There are no works of irrigation that we are aware of. The cultivated grounds are irrigated, but I have not observed that health is in any way affected by it. The cultivation of rice is prohibited within two miles of camp; neither is there any cultivation of hemp, indigo, or flax. 7. The city of Ahmedabad is about 3½ miles from the station. 8. The geological structure is sandy, and the ground new. 9. Water is usually found during the dry season at a depth of about 35 feet, and in the rainy season at about 25 feet. 10. The rain-fall runs off and becomes speedily absorbed. The country being level, there is no adjacent ground, the drainage from which passes into the subsoil of the station. 11. The water supply is derived from deep wells, from which it is drawn by bullocks. There are no tanks in the immediate vicinity. The wells are kept cleared, and there is no malaria. 12. There is a sufficient supply of water, and it is wholesome, colourless, and free from smell. The river water is of sp. gr. 1·001 in the dry season, somewhat greater in the rains. The water from wells is of greater specific gravity. The water from the river is more wholesome than that from wells, which after long use is apt to induce disease of the spleen, a result unknown from the use of river water. The microscopic appearance cannot be determined as there is no instrument allowed. The water is drawn up from wells, and is then distributed

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	about the station by bheesties. We are not aware that better water could be obtained, nor have we any recommendations to offer. 13. We are not aware of any other topographical points bearing on the health of the station. 14. No new stations have been selected in the Bombay Presidency within the last 20 years.
II. Climate.	1. The instruments available for meteorological observations are thermometers and pluviometers. 2. The following Table gives two years of observation :—

Years of Observation.

From January 1858 to December 1859.

Months.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Winds. Direction	Winds. Force.	Remarks.
January -	71	13	78	65	N.N.E.	Moderate.	Agreeable ; occasionally cloudy.
February -	80	31	96	65	N.N.E.	Do.	Agreeable.
March - -	83	21	94	73	N.E.	Do.	Sultry.
April - -	93	22	104	82	S.W.	High.	Hot.
May - -	97	22	108	86	W.S.W.	Do.	Sultry.
June - -	89	10	94	84	S.W.	Do.	Do.
July - -	90	27	104	77	S.W.	Monsoon.	Do.
August -	84	15	92	77	S.W.	Do.	Cloudy.
September -	83	13	90	77	S.W.	Do.	Sultry.
October -	83	13	90	77	N.E.	Moderate.	Sultry ; occasionally heavy dews.
November -	78	17	87	70	E.N.E.	Do.	Cool.
December -	69	19	79	60	E.N.E.	Do.	Do.

3. The climate is dry, except during the monsoon ; sand storms occasionally occur during the hot season, but they do not appear to have any injurious effect. The climate does not appear to affect the health of the troops. They are exposed as little as possible during the heat of the day, the regimental duties being performed morning and evening. The hot season from March to June is the healthiest. October is very unhealthy. During that month and the cold season fevers prevail, chiefly of a quotidian intermittent type.
4. There is no district that we are aware of near the station the climate of which would be more conducive to health.
5. I have served longer at this station and Deesa (both in the same province) than at any other. I have also served at Dharwar in the Deccan about three years, but judging from the hospital records, there appeared to be very little difference in the health of the troops (native). The above is the recorded opinion of the medical member. The president (Col. Lucas) has served upwards of 20 years in Guzerat, 19 of which has been at Ahmedabad. He considers it about the most healthy station in the Bombay Presidency for troops, with common care and prudence.

III. Sanitary Condition of Station.

1, 2, 3. Maps and plans.

4. The following Table shows the barrack accommodation :—

Date of Construction, June 1858.

Total number of rooms or huts, 10 chuppered and 1 tiled.

Total regulation number of non-commissioned officers and men, 50 in each chuppered hut.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.		Ft.	Ft. in.		Ft.	Ft.
2 chuppered Barracks for Artillery -	50	250	11	12	37,812	756	55	1 7	—	—	—
1 Staff Serjeant's Quarters (chupper) - -	2	56	15	12	10,080	5,040	420	1 7	—	—	—
1 tiled Barracks, 4th K.O. Regiment -	100	252	22 1/6	14 1/2	99,038	990	56	1 7	56	4	3
10 chuppered Barracks	50	250	11	12	37,812	756	55	1 7	22	3 1/2	3
2 Staff Serjeants' quarters	2	56	15	12	10,080	5,040	420	1 7	8	3 1/2	3
1 tiled Staff Serjeant's quarters - - -	2	56	15	12	10,080	5,040	420	1 7	8	3 1/2	3
1 Guard Room 1/1 Artillery - - -	8	25	15	12	4,500	562	47	1 7	3	3 1/2	3
1 Chupper Guard Room 4th K.O. Regiment -	8	30	15	12	6,525	815	56	1 7	3	2 1/2	3
6 Prison Cells - -	1	10	10	21	2,250	2,250	100	1 7	—	—	—

In the chuppered temporary barracks the windows are all on the same side (the north). They consist of matting nailed over a wooden framework, hung from the lintel, and opening outwards, supported by lifting sticks. In the tiled barrack the windows are glazed, open outwards, and are on opposite sides. A verandah 6½ feet broad extends the entire length in front of the chupper barracks, and one 10½ feet broad extends all round the tiled

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	barrack. The verandahs are not occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils. 6. The bedsteads are wooden planks upon iron trestles; 1 foot 9 inches from the ground. I have no improvement to suggest. 7. The following table gives the dimension of tents:—

	Dimensions of Tents.							Men to each Tent.	Square Feet to each Man.
	Length.	Breadth.	Superficies.	Height of Wall.	Cubic Content.	Upper Part.	Whole Cubic Content.		
	Feet.	Feet.				About			
Tent Hospital, European	22	14	308	6′ 6″	2,002	2,000	4,002	12	$25\frac{8}{12}$
Tent Hospital, Native	22	15	330	6 0	1,980	1,320	3,300	15	22
Tent, European Serjeants', Single Pole	14	14	196	6 0	1,176	588	1,764	8	$24\frac{1}{2}$
Tent, Staff Serjeant's	10	10	100	6 0	600	300	900	1	100
Tent, Native Serjeants', Double Pole	22	13	286	2 0	572	1,716	2,288	30	$9\frac{5}{30}$

Ahmedabad Arsenal, June 4, 1860. E. WRAY, Major, C. Ordnance.

8. There is a continuous ventilator in the roof of the tiled barrack. Each chuppered barrack has its chupper opened and raised in four places. Each ventilator is 7½ feet by 2 feet. The same system of ventilation obtains in the guard rooms, huts, &c. The ventilation is quite sufficient to keep the air pure at all times. There are no means used for cooling the air, the barracks being temporary.
9. The temporary chupper barracks are constructed of sun-dried brick and mud, with roofs of round teak wood and chupper. The doors and windows are of matting nailed over jungle wood frames. The walls mud, plastered and whitewashed inside and out. The floor is raised from 1 to 2½ feet. The tiled barrack is of burnt brick and mud, with trussed roof of squared teak wood; the walls are plastered inside and out, and whitewashed. The windows are of glass, and the doors half glazed and half panel.
10. The floors are of earth and broken brick, well rammed and solidified; they are raised from 1 to 2½ feet above the level of the ground. They have no passages for air underneath.
11. The barracks being only temporary structures, hastily erected to afford shelter to Europeans at a time of great emergency, have hitherto answered very well, but if European soldiers are permanently to be located in Ahmedabad, substantial barracks must be provided. Repairs are executed by the Public Works Department, and are performed with all reasonable dispatch. The walls and ceilings of barracks are cleansed and limewashed always once a year, but at any time on a requisition from the commanding officer the walls can be whitewashed.
12. Sketch of washhouse; 50 feet by 7. Refuse water drained into cesspools; cesspools are cleansed daily.
13. Sketch of cookhouse; it is 50 feet by 12, and the refuse water is drained into cesspools, and emptied daily. Bheestees bring the necessary supply from the neighbouring wells. Dirty linen is washed by native dhobies in the river.
14. The contents of the privies and urinals are removed every morning and evening.
15. These buildings are ventilated in the same manner as the barracks. The barracks are lighted at night with oil lamps suspended from the roof with iron rods.
16. The barracks neither have nor require any arrangement for draining or sewering. The surface water during the monsoon either flows off into a natural drain, about 150 yards to the west of the barracks, or is rapidly absorbed. The drainage from lavatories, cookhouses, privies, and urinals, being collected in cesspools, can be removed at pleasure. No part of any building is damp, the nature of the soil prevents it. There are no large cesspits nor foul ditches.
17. The refuse of the station is carried away daily by the Barrack department beyond camp limits and burnt.
18. The surface of the cantonment is kept perfectly free from vegetation. There are no old walls or thick hedges, &c., to interfere with ventilation.
19. The sanitary condition of the bazaar is good as respects ventilation, cleanliness, &c., but is rather crowded in consequence of the increased number of troops during the past year; the water supply has been sufficient in consequence of the vicinity of the river. Sweepers are kept for preserving cleanliness in the bazaar, under the supervision of the bazaar master. The native houses are small, but no dung-heaps or cesspits are allowed. There are no native buildings in the vicinity of the barracks to occasion nuisance by the wind blowing over them.
20. Animals are slaughtered at about three-quarters of a mile distant from the station. No particular regulations are in force as to the disposal of the offal; it is removed by sweepers. Were it not that the station is said to be about to be removed, we would recommend the erection of burning kilns.
21. No horses are allowed to be kept in the bazaar.
22. The are no stables at the station, and the picketing grounds for the horses of the artillery and cavalry are to the rear and to leeward of the men's barracks, at a distance of about 150 yards, and a mile from the hospital.
23. There is ample accommodation for married non-commissioned officers and men.

Officers' Quarters.

1. The temporary huts for officers' quarters are small; they are well ventilated and properly drained. Substantial houses are much required, with well-fitting doors and windows to keep out the hot winds.

IV. HEALTH OF THE TROOPS.

1. We are of opinion that the station, district, and native population are tolerably healthy.
2. The most common diseases are fevers, and occasionally cholera.
3. We attribute the healthiness of the native population to the dry sandy nature of the soil, and the absence of large bodies of stagnant water.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	4. The 4th Regiment King's Own came from the Mauritius, where they were from August 4th, 1857, to November 24th, 1858. They enjoyed good health there. The prevailing diseases were hepatic. They arrived at this station February 16th, 1859, and the diseases from which they have since chiefly suffered have been fevers. The 11th Regiment Native Infantry came from Bombay, where they were stationed two years. The health of the regiment was good. They left Bombay 2nd March 1858, and arrived here March 24th. During their residence here they have enjoyed good health. No part of the barracks is remarkable for its unhealthiness. 5. The troops (European) were under canvass from November to March during the time their huts were being repaired, but it had no perceptible effect on their health. 6. I have never been in charge of troops at hill stations. 7. I have not observed whether troops resident for some time on the hills are more or less liable to attacks of disease on returning to the plains. 8 to 16. We have had no experience in regard to the effect of hill stations on the health of troops. 17. The highest ground with which we are acquainted is Mount Aboo, 150 miles from the station. It is used as a sanitarium, and is 4,500 feet above the level of the sea; but we have no experience in regard to it. 18. We have no experience as to the class of soils most healthy for stations. 19. The best age for soldiers proceeding to India is from 20 to 25, and the cold season is the best for them to land. I cannot speak from experience as to the disposal of troops on landing, my duties having been confined to native troops. The above is the recorded opinion of the medical member. Recruits are attached to the depôts in Bombay on first landing, and sent up to Poona and Ahmednuggur as quickly as possible by rail, where all their wants are attended to. The precautions necessary are, good barrack accommodation, attention to clothing and diet, and avoidance of all unnecessary exposure to the sun. 20. It is better for troops to be sent direct from England to India, and then forwarded to well established healthy stations. 21. The mode of transport from the port to the interior is on land by marches, and on water by country boats and steamers when available. 22. The British soldier should serve in India 15 years. 23. Medical boards are always properly conducted. 24. The time of year desirable for invalids to leave India is in January and the commencement of February, from Western India.
Diseases.	1. There are no inspection parades for the discovery of disease amongst natives. We are informed that European troops are inspected weekly. 2. There has been no scorbutic disease at this station. 3. I am informed that out of 1,070 cases admitted into hospital, 4th King's Own, during the past year, 37 were from hepatic disease, but only two deaths occurred. 4. No cases of dracunculus have presented themselves. 5. Out of a daily average of sick from all causes of 28, the proportion of venereal disease would be 5. The medical officer 4th King's Own, recommends the establishment of lock hospitals, which the committee coincide in on the grounds of health; but as they were done away with some years back, being looked upon as sanctioning immorality, the committee must leave it to superior authority to decide. 6. No epidemic has shown itself during the two past years among the European or native troops. 7. There has been no appearance at this station of zymotic diseases. The hot season is the period when they usually prevail, and a sultry and cloudy condition of the atmosphere precede or accompany them. When they do occur, they are generally confined to the crowded parts of the bazaar. Insufficiency of food among the lower classes of the native population, their personal dirty habits, and the overcrowding of their dwellings, would appear to predispose them to zymotic disease. 8. No epidemic having appeared, it cannot be stated whether the duties of the soldiers would have any influence in this respect. 9. In isolated cases quinine has been used as a prophylactic against malaria, with a satisfactory result. 10. We have no recommendations to offer, with a view to the prevention of disease. The country is very open, and there is a free circulation of air throughout the camp.
V. Intemperance.	1. The soldiers at this station are generally temperate, and there are no confirmed drunkards. 2. The returns of admissions into hospital for intemperance are in the office of the superintending surgeon. The diseases directly caused by intemperance are ·08 per cent., and indirectly 3 per cent. Drunkenness is punished as an offence. 3. Spirits are sold in the regimental canteens, and under restriction in the bazaar. The arrack is 24° below London proof: the quantity allowed is one dram daily. Spirit is not part of the ration, either at the station, on march, or in the field. The canteen is never opened in quarters before noon. On the march or on service the men are sometimes allowed to receive their daily dram immediately after coming off the march. This is not good for the health when allowed. Spirits are given as a ration to convalescents at the discretion of the individual medical officer. No other drinks are sold in the canteen or bazaar which are injurious to health. 4. The consumption of spirits by troops is injurious to health. If given in moderation, it is conducive to discipline and efficiency, as it prevents troops going to the bazaar and getting country liquor, which is poison to them. 5. It would be beneficial to health to abolish the use of spirits, but impossible to be carried out. 6. Malt liquor gives an improved tone to the system, which is not imparted by wine and spirits, and the consumption of it cannot be too much encouraged. 7. We understand that there is a coffee room in the 4th Regiment King's Own and artillery, and that it is generally used. The effect of using tea, coffee, &c., is good. 8. It would be beneficial to substitute coffee for the spirit ration in the early morning, and beer in the evening and at dinner. 9. It would be beneficial to permit only beer, tea, coffee, &c., to be sold in the canteens.

AHMEDABAD.
BOMBAY.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	10. I have no other recommendations on these points. 11. Canteen and bazaar regulations annexed. The following are the more important points in the canteen regulations:—Canteen open from 12 to 12¾ o'clock, to issue malt liquor only. Open from 2 to 3 p.m., and from sunset to tattoo, to issue spirits and malt liquor. No man allowed more than one dram of spirits, or one quart of malt liquor at one issue. Allowance of arrack, one dram per diem Arrack to be consumed at the place of issue. All issues to be paid for on the spot. No spirits to be issued before dinner time. Intoxicated persons or men under punishment not to enter the canteen. By the bazaar regulations no liquor can be sold to any European without the written permission of an officer.
VI. DIET.	1. The ration for British troops consists of 1 lb. bread, 1 lb. beef, 5 days, and 1 lb. mutton 2 days a week, 4 oz. rice, 1 oz. salt, 2½ oz. sugar, $\frac{10}{21}$ oz. black tea, $\frac{5}{21}$ of green tea, 1 lb. vegetables, comprising ⅓ potatoes, ⅓ onions, ⅓ yams, 3 lb. firewood. No changes are found necessary. The rations are inspected by the orderly officer of the day. 2. A complete ration is issued, including a due proportion of vegetables. The stoppage is 3 annas 4 pice daily. The soldier has three meals a day:—Breakfast at 7 a.m.; dinner at 1 to 1 p.m., and tea at 4 p.m. 3. We would recommend giving mutton four times a week, and beef three times, instead of as at present. The beef in this country is lean and tough, and more indigestible. The rations cannot be disposed of. 4. The cooking is done in cookhouses by native cooks. The kitchens are clean, light, and well ventilated, and water is supplied by bheesties. The meat is boiled and roasted, and is at all times properly done and cooking sufficiently varied. During a march the men are halted and provided with coffee in the early morning. 5. Gardens might be advantageously cultivated, under such regulations as the commanding officer might see fit to adopt.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress consists of 1 wicker helmet, 1 forage cap and cover, 1 cloth tunic, 1 serge frock, 2 khakee frocks, 1 pair cloth trousers, 1 pair blue ditto, 2 pairs khakee ditto, 3 pair boots (2 English). The accoutrements are 1 20-round pouch, 1 40-round ditto, 1 pouch belt, 1 waist belt, 1 waist belt plate, 1 firelock sling. The present dress, as lately altered, is suitable to the climate, and under the present system no improvements can be suggested.
Duties.	1. The men may be drilled either at home or in India. 2. Drills are not prejudicial to health as at present arranged, viz., morning and evening, which are the best hours. There are no general orders on the subject. The following are the average number of nights the men have in bed during the week.

	Serjeants.	Buglers.	Corporals.	Privates.
European Artillery, 1st Company, 1st Battalion - - -	5	3	5	5
4th King's Own Regiment - - - - - -	2	2	4	6
	Havildars.	**Buglers.**	**Naigues.**	**Privates.**
Native Artillery, 3rd Battalion - - - - - -	5	2	5	3½
11th Regiment Native Infantry - - - - - -	5	6	3	4
14th Regiment Native Infantry - - - - - -	3	3	3¼	4

	3. Guards are mounted close to the barracks, within 20 yards. They last day and night. Picquets from sundown till gun fire in the morning. There are roll calls morning and evening and at tattoo. We have not discovered that night guards have any injurious effect on the health, and we cannot suggest any additional precautions.
VIII. INSTRUCTION AND RECREATION.	1. There are no ball courts, day-rooms, workshops, theatre, or gymnasia at the station. There is a skittle ground and gardens; the latter at present not worked owing to the hot weather. There is no school room built for the purpose, but the school is held in one end of the harness room, a very hot place, and unsuited to the purpose. There is no trained schoolmaster; one of the soldiers does the duty in the 1/1 artillery, and is not properly qualified. There is no building for the library; one of the non-commissioned officers' quarters is used for it; it has one lamp. There are no proper amusements for the men, and no place for them to go to when wet or in the heat of the day. The barracks are very narrow. There are strict orders prohibiting men from exposing themselves to the sun in the heat of the day. Without such restrictions there would be more instances of apoplexy than there are. 2. For increasing the means of recreation we would recommend a ball alley, a good school room, and a gymnasium. 3. The institution of soldiers' savings' banks would be advantageous. 4. There is sufficient shade to enable the men to take exercise from verandahs, &c.
IX. MILITARY PRISONS.	1. Six cells have just been erected; they are substantially built of burnt brick; each cell is to hold one man. They are badly arranged for ventilation.
X. FIELD SERVICE.	1. We know of no local regulations for field medical service. 2. The medical officer has full powers to recommend anything tending to the health of the troops, as to the time of marching, encamping, &c. 3. He has full power to recommend or to object in all matters of sanitary regulation, and his doing so would lead to the assembling of a committee to consider and carry out any subject he may bring forward. 4. The inquiry respecting the arrangements adopted in the Presidency for field hospitals, supplies, &c. we respectfully refer to the Inspector-General at Bombay for reply. Sick carriage consists of doolies, sick carts to hold four, and kagamas or camels for convalescents.

References to Subjects and Queries.	Replies.
XI. Statistics of Sickness and Mortality.	1. The following form shows the statistics of sickness, &c. at Admedabad:—

European Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1857-58	Detachment H.M. 72nd Highlanders; Do. do. 83rd Regiment; Do. do. 86th Regiment; Do. do. 89th Regiment	717	445	3	—	—	92	2	3	—	70	2	5	—	—	—	236	—	851	7	118·6	0·9
1858-59	H.M. 4th King's Own do.; Detachment H.M. 51st do.; Do. do. 89th do.	542	834	6	—	—	46	—	23	2	223	1	18	4	—	—	433	—	1,577	13	290·9	2·3
1859-60	H.M. 4th King's Own do.	525	670	7	—	—	29	2	42	2	114	1	10	4	3	2	336	1	1,204	19	229·3	3·6
	European Troops in the Indian Army.																					
1857-58	1st Company 1st Battalion Artillery	50	85	2	—	—	6	—	1	—	19	—	2	—	—	—	33	—	146	2	292·0	4·0
1858-59	Do. do. do.	78	72	—	—	—	11	—	2	—	36	—	2	—	—	—	86	—	209	—	267·9	—
1859-60	Do. do. do.	100	98	1	—	—	5	—	7	—	21	—	4	1	—	—	77	2	212	2	212·0	10·0

Native Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1850-51	4th Battalion Artillery; 5th Regiment Native Infantry; 7th Do. do.; 12th Do. do.; Staff and Details	1,831	1,327	4	5	1	15	1	7	—	156	—	11	1	32	14	694	1	2,247	22	122·7	1·2
1851-52	4th Battalion Artillery; 7th Regiment Native Infantry; 12th Do. do.; Staff and Details	1,779	1,064	5	2	—	16	2	3	—	174	3	12	—	26	9	665	3	1,969	22	110·6	1·2
1852-53	3rd Battalion Artillery; 4th Do. do.; 7th Regiment Native Infantry; 12th Do. do.; 28th Do. do.; Staff and Details	1,670	1,233	3	2	—	29	2	5	1	149	3	13	2	4	2	539	3	1,974	16	118·1	0·9
1853-54	3rd Battalion Artillery; 7th Regiment Native Infantry; 25th Do. do.; 28th Do. do.; Staff and Details	1,861	1,669	18	7	—	38	1	3	1	203	3	14	—	—	—	953	4	2,887	27	155·1	1·4
1854-55	3rd Battalion Artillery; 25th Regiment Native Infantry; 28th Do. do.; Staff and Details	1,733	1,033	10	7	1	18	—	1	—	156	1	27	1	69	28	785	6	2,096	47	120·9	2·7
1855-56	3rd Battalion Artillery; 2nd Grenadier Regiment Native Infantry; 25th Regiment Native Infantry; 28th Do. do.; Staff and Details	1,926	818	6	21	—	35	1	7	—	195	2	14	1	1	1	689	1	1,780	12	92·4	0·6
1856-57	3rd Battalion Artillery; 2nd Grenadier Regiment Native Infantry; 25th Regiment Native Infantry; Staff and Details	1,858	954	1	3	—	54	2	10	—	206	2	35	2	17	12	1,053	1	2,334	20	125·6	1·0
1857-58	3rd Battalion Artillery; 2nd Grenadier Regiment Native Infantry; 7th Regiment Native Intantry; 11th Do. do.; Staff and Details	2,725	1,693	20	30	—	82	1	9	—	266	4	33	2	1	1	1,512	9	3,626	37	133·0	1·3
1858-59	3rd Battalion Artillery; 2nd Grenadier Regiment Native Infantry; 11th Regiment Native Infantry; 14th Do. do.; Staff and Details	2,093	811	11	36	—	32	5	8	1	217	4	23	1	1	—	1,023	4	2,151	26	102·7	1·2
1859-60	3rd Battalion Artillery; 11th Regiment Native Infantry; 14th Do. do; Staff and Details	1,545	1,017	7	15	—	47	1	9	1	163	1	13	1	22	13	752	2	2,088	26	196·6	1·6

European Women and Children.

Years.	Station.	Corps.	Women. Strength. European.	Women. Strength. Indo-Europeans and Natives.	Women. Strength. Total.	Women. Treated. Europeans.	Women. Treated. Indo-Europeans and Natives.	Women. Died. Europeans.	Women. Died. Indo-Europeans and Natives.	Women. Ratio per Cent. to Strength. Treated.	Women. Ratio per Cent. to Strength. Died.	Children. Strength. Europeans.	Children. Strength. Indo-Europeans.	Children. Strength. Total.	Children. Treated. Europeans.	Children. Treated. Indo-Europeans.	Children. Died. Europeans.	Children. Died. Indo-Europeans.	Children. Ratio per Cent. to Strength. Treated.	Children. Ratio per Cent. to Strength. Died.
1858-9	Ahmedabad.	Her Majesty's 4th King's Own Regiment.	44	—	44	9	—	—	—	20·4	—	67	—	67	1	—	—	—	1·4	—

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General Medical Department, Bombay, 27th July 1860.

W. C. Coles, Assistant Surgeon, Secretary.

AHMEDABAD. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. Plan of new hospital. 2. A new hospital is just completed, which is a very good one. The building at present used for a hospital by the 4th Regiment is a large bungalow in the N.I. lines, formerly the residence of a general officer. It contains eight rooms and accommodates 54 patients. The division into so many small compartments prevents that free ventilation so desirable for the sick; and in no way does this building afford the necessary accommodation for a European regiment. There are no quarters for 1st-class servants, and the offices in the rear give but ill shelter for the 2nd class. Compared with the rest of the buildings in camp belonging to regiments it is a superior place, inasmuch as it possesses chunam floors, and walls, and a ceiling. The recent erection of puckerries and officer's quarters, and the increased strength of the corps, renders it neither large enough nor fitted for its purposes, for such an essential condition as free ventilation is destroyed by the accumulation of dwelling houses in its vicinity and to windward thereof. 3. The water for hospital use is supplied from a well in the compound, and is good and abundant. 4. Refuse water and other impurities are removed by means of cesspits. 5. There are no air passages below the wards, which are raised about two feet from the level of the ground. The roof water sinks into the subsoil; there is no surface drainage. Of the permanent hospital the walls are burnt brick and lime, sufficiently thick to keep the hospital cool. The roof is double-tiled, and ventilated by iron cowls. The hospital is surrounded by a good large verandah which is frequently used for the accommodation of sick. The hospital consists of one flat only. The following table shows the accommodation in the temporary hospital. Date of construction, not known. Total number of wards, 8. Total regulation number of beds, 59.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.			Feet.	Feet.		Feet.	Feet.
1	8	22	20	18	6,920	865	55	2	—	—	—
2	5	18	11	12	2,276	456	39	—	—	—	—
3	12	35	20	18	12,600	1,050	58	—	2	6	4
4	8	20	19	18	6,540	855	47	—	—	—	—
5	8	20	20	18	7,200	900	50	—	2	6	4
6	4	17	10	14	1,870	467	42	—	1	6	4
7	5	21	10	11	2,310	462	42	—	1	6	4
8	4	17	10	11	1,870	467	42	—	—	—	—

N.B.—The wards without windows have each 4 doors.

The permanent hospital is so placed as to receive the full benefit of the prevailing winds, that is, the hospital for the 1st company 1st battalion artillery. The windows open outwards, and their arrangement and construction are conducive to ventilation and coolness.

6. The wards are ventilated by the windows and the iron cowls on the roof. There are no jalousies or jhilmils.
7. Punkahs and tatties are used for cooling the air.
8. There are no means of warming. The walls and ceilings are cleansed and limewashed every three months.
9. A commodious latrine has been lately constructed, but at too great a distance from the main building to admit of a covered way. There are cesspits in connexion with the hospital latrines; they are satisfactorily deodorized by salt, lime, and charcoal, and the refuse is removed morning and evening daily.
10, 11. The lavatory arrangements consist of rows of basins around a small bath room, filled by hand from the well in the compound. There is also a large bathing tub, good.
12. No arrangement is required for washing linen; it is done by dhobies.
13. There are two storage rooms for medicines and clothing.
14. The bedsteads are made of iron, and the bedding is good. The mattresses are stuffed with straw and periodically renewed.
15. The kitchen is one of the outhouses in rear of the hospital, a mere make-shift. The cooking utensils are those in common use in the country, and are sufficient and good.
16. Forms transmitted.
17. The attendance on the sick consists of one hospital serjeant and one orderly, to march the sick to and from hospital. It is sufficient.
18. The sanitary condition of the hospital is good. No epidemic has occurred.
19. I have no improvements to suggest.
20. In the 4th King's Own hospital the convalescents walk in the large compound. There are no seats, but there is shade. There is the same provision for the 1st company 1st battalion artillery, with the exception of shaded walks.
21. There is a row of patcheries, but no proper hospital for the wives and children of the 4th King's Own. The women of the artillery have a commodious hospital, and the arrangements are satisfactory.
22. There are no special local hospital regulations.
23. The medical officer has full powers to suggest or object in all sanitary matters affecting the state of the hospital.
24. There are no convalescent wards; such would be an advantage.

XIII. BURIAL OF THE DEAD.

1. The burial-ground for British troops is about a quarter of a mile from the station. It is properly situated, being to the N.E.
2. It is 160 feet long by 160 broad. The soil is sandy, and the ground is carefully kept.
3. The grave space allowed is six feet by two. The interval between the graves 1½ feet. The depth of graves is from six to seven feet. They are never re-opened unless to inter another

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead—*cont.*	member of the family, or to erect a tomb. Interment takes places within 24 hours after death at ordinary times, and during epidemics as soon as possible. Arrangements for natives are left to the people themselves. Mahometans bury their dead, and Hindoos burn them. 4. The graveyard is never offensive. British troops are buried agreeably to the army regulation, in the morning and evening. 5. The dead of camp followers and bazaar people are disposed of by their own relations according to the rules of their different castes. 6, 7. No injury whatever to health accrues from the present practice, and no improvent can be suggested.

(Signed) Charles Lucas, Colonel Artillery, Commanding the Station.
M. Thompson, Staff Surgeon, Ahmedabad.
C. T. Boddam, Captain Bombay Engineers, Executive Engineer, Ahmedabad.

4th May 1860.

BARODA.

Accommodation { Queen's Troops.—Either Artillery or Infantry - - 400.
Native Troops. { Artillery - - - 140.
Infantry - - - 1,200.

N.B.—There are gunsheds for one field battery.

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is flat, sandy, and highly cultivated, and very swampy in the monsoon. There is a great deal of wood, principally trees and hedges, with little jungle, but plenty of water. 2. The elevation of the station above the level of the sea is 90 feet, but on a level with the adjacent country. A small river runs along the eastern boundary of the cantonment almost stagnant for 9 months in the year. There is also a tank 600 yards from the barrack and 300 yards from the nearest bungalow. There is no higher or healthier ground adjoining the station. 3. The hill fort of Powagurh distant 26 miles is the only high ground within sight of the station. 4. The nearest water to the station is the Wishwamuntree river, 100 yards from the hospital. The vicinity is liable to overflow near the banks in the rains, which lasts as long as the rain falls, leaving stagnant pools. There are a few nullahs near the station, and water pits all over the country, which have a very prejudicial effect on health. 5. The station is so encumbered with trees that it is not sufficiently exposed to the breeze. The temperature of the station is raised by the buildings being exposed to reflected sun heat. The breeze blows from the direction of the sea for the greater part of the year, and from November to March the land wind blows from east and north-east. The surrounding country is cultivated. There are no large works of irrigation near the station, and artificial irrigation is not observed to have any effect on the health of the station. The cultivation of rice is prohibited only within camp limits, and plenty of rice is grown close to the cantonment in every direction. The country outside the limits belongs to the Gaicowar. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The city of Baroda to the south of the station is distant a mile and a half. 8. The geological structure of the district is alluvial deposit. The surface is admixture of black soil and sand, and the subsoil contains more clay. The station occupies new ground. 9. Water is usually found at a depth of 50 to 35 feet in different parts of the camp. 10. The rainfall, or water from surface springs, does not flow readily away. It disappears partially by sinking into a pervious subsoil; partly oozes out near the level of the station; but principally lies on the surface till evaporated. There is no higher ground, the drainage from which passes into the subsoil of the station. 11. The water supply of the station is derived from wells, and is stored in a tank of 12,000 square yards of surface; it is principally used for washing. It always has water in it. There are no plants whatever in the tank, but large quantities of fish and frogs. There is no tank used for drinking purposes that is also used for bathing. The water tank is not liable to pollution from leaves or any other matter falling into it. There is no nuisance or malaria experienced from the tank, but there is from the water holes. Draining is the only means that can be adopted for preventing this. 12. The water supply of the station is unlimited. The water is clear, and without taste or smell; it is soft, of good quality, and contains no lime salts. The chemical composition of its solid contents is, for the most part, chloride of sodium; but it also contains carbonate and bicarbonate of soda, and is alkaline; the evaporated water strongly so. It also contains a trace (faint) of lime, but no iron. There are no sulphates, phosphates, or nitrates in it. The water is raised in leather buckets by manual and bullock labour, and distributed by water carriers. 13. The villages in Guzerat, but more particularly in the Gaicowar's territory, are excessively filthy, and no means are taken for cleansing them. Water lodges in every hollow, and as the soil is very tenacious, remains stagnant till evaporated. Every road also is partly under water in the rains, there being no made roads in all Guzerat; roads are generally lower than the adjacent fields, and have very high thick hedges on each side. Filth, excessive vegetation, and stagnant pools in the surrounding country, must have an effect on the health of the station. 14. New stations are selected by order of Government, either after inquiry or trial.

BARODA. BOMBAY.

References to Subjects and Queries.	REPLIES.
II. CLIMATE.	1. There are a thermometer and pluviometer at the station, for conducting meteorological observations.

2. The Table of meteorological observations is made up from 3 years' barometrical and 12 years' thermometrical observation, and from observations for 12 years of the rain-fall, and prevailing winds.

YEARS of OBSERVATION from January 1847 to December 1853.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain.	Winds. Direction.	Winds. Force.
		°		°	°	Inches.		
January	30·220	71	—	84	58	00·2	E. & N.E.	Moderate
February	·215	70	—	90	56	·02	E. & N.E.	Moderate
March	·542	83	—	96	71	·06	N.E., N.W.	High
April	29·845	81	—	94	69	·00	W.	High
May	·801	94	—	105	83	·57	W. & S.W.	High
June	·755	89	—	98	80	6·26	S.W.	Calm / Variable
July	·650	85	—	91	80	15·85	S.W.	Monsoon
August	·730	84	—	88	76	8·10	S.W.	Monsoon
September	·788	83	—	90	77	4·26	Variable.	Variable
October	·671	80	—	87	73	0·37	W.	Calm
November	30·222	77	—	90	64	·02	NNE., NW	Calm
December	·993	73	—	89	58	·07	E. & N.E.	Moderate

3. The climate is comparatively moist, and very damp in the rains. Fogs prevail to the end of November, and during the hot season hot winds and dust prevail; it is never very cold. There are too many trees about. The influence of the climate on the troops is deleterious. Woollen clothing and good diet should be provided during the rains. Parades should be either early or late, and the men should not be exposed to the sun. The most healthy time of year at the station is from November till June, and the most unhealthy from June till November. The prevailing diseases are fevers of a very malignant type.

4. At about 18 miles from the station there is a place, Dubka, on the bank of the Mhye river, admirably adapted for the formation of a sanitarium. It is situated on the high bank of the river, on one of its bends. The soil is sandy, and cut up by numerous deep ravines, which ensures its being well drained, even during the rains. Removal to Dubka proved of the greatest advantage to a detachment of the 33rd Foot, when attacked by cholera in March of the present year.

5. The following is a list of stations, at which the Assistant Surgeon has served:—
Bombay, Mulligaum, Ahmednuggur, Ouna, Vingorla, Rajkote, Deesa, Nusseerabad, Neemuch; nine healthy stations.
Kurrachee, Dhoolia, Ahmedabad, are not injurious.
Baroda, Hydreabad, Sukkur, positively injurious.
Poona, healthy. Deesa is healthy, except in the very hot weather. Hyderabad and Mooltan, unhealthy; Belgaum, healthy; Peshawur, unhealthy; Dhoolia, average; and Baroda, unhealthy.

III. SANITARY CONDITION OF STATION.

1, 2, 3. Plan and tracings of the station, surrounding country, barracks, &c., are transmitted.

4. TABLE of barrack accommodation:—

Date of construction of barrack, 1859. Total number of rooms, 4.

Barrack Rooms or Huts.	Regulation Number of Men in each Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
4 Temporary Barracks each.	60	Ft. In. 200 0	Ft. 20	Ft. To tie Beam. 14	Ft. 56,000	933	66	Ft. In. 1 8	40	Ft. 4	Ft. 2½
Total -	240 men	—	—	—	—	—	—	—	—	—	—
Guard Room -	12	66 6	16	Mean 12	12,768	1,064	88	1 8	—	—	—

5. There are windows and doors on both sides of the rooms, and doors at the end; they open inwards. There is a verandah all round each barrack 7 feet wide, and 8 feet to the eaves; used by the soldiers as sleeping quarters on hot nights. There are no jalousies or jhilmils.

6. The bedsteads used in barracks, tents, &c. are boards supported on iron trestles with a straw mattress. Coir mattress is recommended.

7. The following are the dimensions and structure of the tent:—

Description of Tent.	Dimensions.					Number of Men allotted to each Tent.		Cubic Feet to each Man.		Number allotted to each.		Cubic Feet per Man.	
	Length.	Breadth.	Height in Centre.	Height of Walls.	Contents in Feet.	European.	Native.	European.	Native.	Europeans if Sick.	Natives if Sick.	Europeans Sick.	Natives Sick.
	Ft.	Ft.	Ft.	Ft. In.									
European soldiers' double top single pole.	12	12	11	5 8	1,072	16	—	67	—	8	10	134	107
Hospital, double pole, double top.	19	12	11	5 8	1,772	25	—	70	—	12	16	148	110
Native Rowlie, No. 1. single top, double pole.	18	8	9	2 0	657	12	30	55	22	10	12	65	55
Native Rowlie, No. 2, single top, double pole.	14	7	8½	2 0	423	10	12	42	19	8	10	53	42

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	8. The barracks are ventilated by openings in the roof averaging 10 by 2 feet. These afford sufficient ventilation. The air is cooled by means of punkahs and tatties. 9. The barracks are made of burnt brick and mortar pillars supporting the roof and the spaces between, filled up with sun-dried brick and mud, the roof is double tiled. 10. Some of the floors of the barrack rooms are made of brick and some of chunam or lime, raised 4 feet above the ground. There is no passage for air beneath them, being all solid. 11. The materials of which the barracks, tents, &c. are constructed, are good enough and suitable for the climate. The barracks are kept in repair by the Engineer department; repairs are quickly executed. For the general cleanliness of camp the cantonment staff officer is responsible. The walls and ceilings are cleansed and lime-washed whenever they require it. 12. The water for the men's lavatories is suppled by bheesties. The water is drained out into an open ditch 7 or 8 yards from the room. A tub is used for washing. 13. The water for the barrack cook-houses is supplied by bheesties, and the refuse water is drained off into cesspools in the rear. The linen of the station is washed by dhobies, who take the things away and wash them in the river or in the tank. 14. The contents of the privies are taken away by sweepers through a trap-door in the rear. 15. The ventilation of the privies is effected by openings in the side walls under the eaves. 16. The only drainage is that which comes off the roof in the rains, when a shallow ditch is excavated all round, and the water carried off by an open drain 1ft, by 2ft. The country being so flat prevents any good system of drainage being carried out except at great expense. Neither barrack or hospital is damp. The fluid refuse of the barracks is received into cesspits, which are situated in rear of the cook-houses, and are not near the wells; they are distant from the barracks about 40 yards. There are nullahs on all sides of the station; but average 400 or 500 yards from the barracks, stagnant pools remain in them occasionally, 17. With respect to the surface cleansing of the cantonment, the dead leaves are collected and burnt once a year; the refuse, &c. is thrown into the nearest nullah. 18. No grain is allowed to be grown in the cantonment. There are no old walls, thick hedges, &c. interfering with the ventilation of the station or bazaar. 19. The bazaar is well drained, but badly ventilated and much crowded. The streets are very narrow, for want of space, but they are clean. All inhabitants of the bazaar keep their premises clean, and collect the sweepings in front of the house, whence it is removed in rubbish carts. A daily inspection is made. Four peons are allowed, which is sufficient as sanitary police. There are no native houses near the station. No nuisance is experienced in barracks from wind blowing over native dwellings. 20. The animals for the use of the troops are slaughtered within the station. The place is kept scrupulously clean, and inspected daily. The offal is removed daily. No nuisance is experienced in the station. 21. 22. There are no cavalry or artillery stables, but a shed only for sick horses, to the leeward of the barracks. The picketing grounds are arranged in lines, and surrounded by a hedge, they are too near the hospital. 23. There is plenty of accommodation for married non-commissioned officers and men. No married people occupy the barrack rooms.
Officers' Quarters.	1. The sanitary condition of officers' quarters at this station is good. There is no arrangement for drainage; as the country is so flat a very expensive general system of drainage would be required. Thinning the trees is an improvement much required, and one which is now being made.
IV. Health of the Troops.	1. The whole district, both as regards the station and the surrounding country, is decidedly unhealthy. 2. Cholera, intermittent fever, variola, leprosy, and spleen disease are prevalent among the native population. 3. The prevalence of the above diseases may be attributed to a general want of cleanliness among the population, to bad drainage, and a consequent impurity of air, in addition to which the whole country for many miles is thickly covered with trees. 4. The detachment of Her Majesty's 33rd regiment left Deesa, in September, 1859, having been there about 15 months, during which time the health of the men was tolerably good. They suffered from bad rations in the hot weather, and there were some deaths in the regiment from apoplexy. They arrived at Baroda in good health in the early part of March, 1860, and only suffered from fevers until the 28th March, when cholera appeared, and they lost 20 men out of 200. From September 1859 to March, 1860, the detachment was on field service in Okamundel, and was very healthy. There is no portion of the men's accommodation at this station more healthy than the rest. 5. The troops have always lately been marching for a great portion of the year as a detachment on field service. Europeans were camped at Dubka in April and May to avoid cholera.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	6. None of the Commissioners have been in charge of troops at hill stations. 7. None of the Commissioners have any experience of the effects of hill stations on troops. Major McGrigor has been at the Nielgherry hills for two years, and at Aboo for six months, when suffering from fever, and having got over the attack had no return of it on going back to the plains. 8, 9, 10. No experience in hill stations. 11. The best time for residence in hill stations is from April to June, and three months the shortest period of residence which would enable troops to receive full benefit to their health. 12, 13. The Commissioners have had no experience as to the injury likely to be inflicted on the health of troops on leaving hill stations for the plains, or what precautions are necessary on such occasions. I have never heard of any one finding his health impaired by prolonged residence at a hill station; but the reverse. 14. The Commissioners consider that residence at a hill station, with the shortest possible period of service in the plains, as most conducive to health. The present arrangement of changing stations about every three years on the plains seems as good as could be adopted. 15. I believe there is scarcely any barrack or hospital accommodation for troops at hill stations in this presidency. A few hills are used as sanitaria, but not as stations for troops. 16. The most suitable sites for hill stations are obtained at an elevation of between 4,000 and 8,000 feet above the level of the sea. 17. There is no higher ground near this station which could be advantageously occupied as a hill station. There is a hill fort, Powagurh, about 26 miles off, but is not sufficiently extensive. 18. Black soil, for a station, is generally considered unhealthy. 19. Soldiers should not be sent to India until over 20 years of age, and should be landed not earlier than November nor later than January. I am unable to recommend any precautions beyond the regulations at present in force. 20. Troops should be sent direct from the home depôts to India. They should be sent on arrival to hill stations. 21. The mode of transport of troops from port to the interior is dependent on the station. Sometimes it is by rail, bullock train, or steamer, if available; but generally by marches on foot. Ample regulations exist for preserving the health of the troops, if they are acted up to. 22. The number of years I consider a British soldier should serve in India is seven. 23. No answer to this question. 24. Invalids should leave India for home about the month of February.
Diseases.	1. The Europeans are inspected weekly every Saturday morning, and the native troops at irregular intervals, at the discretion of the medical officer. 2. There has been no case of scorbutus at this station within the experience of the Commissioners, which is, however, limited to three months. 3. There have been three serious cases of hepatitis occurring among the Europeans since the arrival of the troops now in Baroda. Of these one proved fatal, one was invalided, and one recovered, in addition to which some more trifling cases of congested liver have been under treatment. Under these circumstances the Commissioners (whose experience of the station, as above stated, is very limited, and who have no records to guide them) are of opinion that this disease is not prevalent in Baroda. 4. Among the Europeans no cases of dracunculus have occurred, but among the native troops it has been prevalent. 5. Within the experience of the Commissioners venereal diseases have been rare at this station. Among the Europeans there has not occurred a single case of syphilis since the arrival of the detachment at the station, and only a few of gonorrhœa. The native troops have enjoyed an equal immunity. 6. The following are the diseases from which the troops at this station have suffered:— *Fevers.*—Among the Europeans, common continued fevers, with a tendency to head symptoms, and lasting for 3 or 4 days, have been prevalent. Those of the intermittent and remittent types have been comparatively rare. *Dysentery.*—There have been very few cases, and those of a mild form. *Cholera.*—This disease has been prevalent in the station and surrounding country during the past hot season, proving fatal to 20 men of the detachment 33rd regiment (the strength of which was 200), and to many of the native troops, and to large numbers in the city, bazaar, and villages surrounding the camp. *Small-pox.*—No cases have occurred since the arrival of the troops now in Baroda. *Rheumatism.*—There have been no cases of acute rheumatism, and only a few of the chronic form. The following shows the proportion which admissions and deaths from these diseases bear to the total admissions and deaths. Detachment H.M. 33rd Regiment. Return of sickness and mortality in the above detachment from the under-mentioned diseases during the period of its station at Baroda, from 11th March to 31st July 1860.

Diseases.	March 1860. Strength 197. Admissions during the Month.	April 1860. Strength 173. Admissions during the Month.	May 1860. Strength 177. Admissions during the Month.	June 1860. Strength 176. Admissions during the Month.	July 1860. Strength 177. Admissions during the Month.	Total Admissions.	Deaths.
Fevers	29	24	4	27	34	118	1
Dysentery	—	—	—	—	—	—	—
Cholera	3	20	—	—	—	23	20
Small Pox	—	—	—	—	—	—	—
Rheumatism (chronic)	3	1	2	1	—	7	—
	35	45	6	28	34	148	21

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	7. The more frequent zymotic diseases are febrile diseases and epidemic cholera. Fever appears about October, when vegetation is decaying, and moist muggy heat prevails; cholera about the end of the hot season, when dry hot winds and dust prevail. The eating of large quantities of unripe fruit by the troops and natives seems to be the predisposing cause of these diseases. 8. Every precaution is taken to preserve the soldiers from excessive fatigue or any predisposing influence to disease. 9. Doses of quinine have not been given as a prophylactic against malarial disease at this station. 10. The cause of unhealthiness does not exist within the station, but in the surrounding country, and in its general position and want of drainage.
V. Intemperance.	1. As a rule, the men at this station are temperate, the majority of the detachment, 33rd regiment, being soldiers not brought to notice for drunkenness. There are no confirmed drunkards; and although several are hard drinkers, no court-martial for habitual drunkenness has taken place. 2. There are no admissions into hospital from diseases directly caused by intemperance; but indirectly a large amount of the fever cases are caused by the intemperance of the men. Those who are hard drinkers come into hospital time after time with fevers. Drunkenness is always punished as an offence. 3. Distilled spirits are sold at the canteen to Europeans, and in the bazaar by a contractor to natives only. One dram of arrack and 1 quart of porter can be purchased at the canteen per diem, but form no part of the ration for soldiers, either at the station, on march, or in the field. The men cannot get spirit before morning parade from the canteen, and any liquor they drink then must be obtained from improper sources. Spirit is never given as a ration to convalescents. No injurious drinks other than intoxicating ones are sold either at the canteen or bazaar. 4. Taken in moderation, spirit is not injurious to troops or convalescents. Taken moderately, it does not interfere with the efficiency or discipline of the corps; but, at the same time, most of the crime among the Europeans is attributable to this source. 5. The use of spirituous liquors is restricted, but all the surrounding villages are the Gaicowar's, not subject to our regulations, and the soldiers procure liquor by some secret means. 6. In my opinion, malt liquor is preferable to spirits. 7. Tea, coffee, lemonade, soda water, &c., are not much used at this station. 8. As above stated, there is no spirit ration, but it can be procured at the canteen on payment. 9. It would not be beneficial to prohibit the sale of spirituous liquors, because they can procure worse liquor secretly, and it is impossible to prevent this. They can purchase at the canteen a quart of porter and a dram of arrack per diem. 10. The interior of the canteen is very dull, and has no furniture except tables and benches. The addition of draught boards, chess, and backgammon would render the canteen a more pleasant lounge for the soldier; and the sale of tea and coffee might be added. 11. No liquor is allowed to be sold in the bazaar by any contractor to any European soldier, and rewards may be offered not exceeding 50 rupees for the apprehension of any person providing the men with illicit spirits, which reward shall be charged against the contractor, if it occurred through his negligence. The sale of European or other foreign spirits is prohibited in the camp bazaars without licence. All cooks, clean boys, &c., must drink their liquors at the shops; and they are on no account allowed to take any away. All liquor shops are closed at 9 p.m.
VI. Diet.	1. The composition of the ration for Queen's British troops is as follows, viz., 1 lb. of bread, 1 lb. meat, 1 lb. vegetables, 3 lbs. wood, 4 oz. rice, 1 oz. salt. $2\frac{1}{2}$ oz. of sugar, $\frac{10}{21}$ oz. of black tea, and $\frac{5}{21}$ oz. green tea. Mutton is issued twice a week, and on the remaining days beef. The vegetables consist of 12 oz. potatoes, and 4 oz. onions, or 12 oz. pumpkin and 4 oz. onions. The ration generally is very bad, the meat being of poor quality, deficient in nourishment and unpalatable. The vegetable supply is limited to potatoes (often bad), onions, and pumpkins, an innutritious watery vegetable, very cheap, and consequently substituted for potatoes by the contractor when he is not prevented. There is a daily inspection made of the ration by the Quartermaster Serjeant, and four times a week by the officers of the detachment. On any complaint being made the ration is reported on by a board, consisting of two officers and the medical officer of the detachment. 2. There is a complete ration with a due proportion of vegetables, but the latter are insufficient, and the ration generally, as above stated, is bad; there is no fruit included in it. The stoppage is 3 annas 4 pice per day per man. The men have breakfast at 7 a.m., consisting of bread and tea, dinner at 1 p.m. composed of meat and vegetables, and supper at 4 p.m. of bread and tea. The proportion of vegetables which enters into the constitution of the ration is 40 per cent., but of most inferior description. 3. In this station where the meat is so very bad, the issue of preserved meat (similar to that supplied to troops on board ship) twice a week, would be most conducive to the health of the European troops: this remark applies more especially to the hot weather. Measures should also be taken for the regular supply of wholesome vegetables. There is no special arrangement for the prevention of the disposal of any part of the ration by the troops, beyond the fact that the orderly corporals and orderly men of each company are responsible for the due supply of the ration to the men of their own company. The men show no disposition to sell their ration; on the other hand they have often to buy extra meat out of the bazaar. 4. The means for cooking available at this station consist of what are called cooking pots, copper tinned, and are similar to those used by all classes of Europeans in this country. The cooks are for the most part Indo-Portuguese. The kitchens are well ventilated; they are blackened inside by the smoke from the open fireplaces, but are otherwise clean. The food is both boiled and roasted, also stewed, curried, fried, and cooked in several other ways, at the option of the soldier. The cooking is properly done and sufficiently varied. Tea is prepared twice a day, but not coffee; the former, supplied by the commissariat, is always good. During a march there is usually a half way halt, when coffee is provided for the men on payment, but it is generally of indifferent quality. I have observed that it is apt to give the men diarrhœa on the march.

References to Subjects and Queries.	REPLIES.
VI. Diet—*cont.*	5. Gardens for the soldiers would be an advantage most decidedly, wherever there is a permanent European station. Not only would good vegetables be thus obtained for the men, but it would also be a source of healthy amusement to them. They should be established under this regulation, that each man should have a piece of ground a quarter of an acre in extent, each company's plot of ground to be separate. This plan is calculated to excite a spirit of emulation among the men.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress consists of a loose tunic of khakee in hot weather and red serge in cold, trousers of khakee in the hot, and the serge in cold weather for Europeans, with khakee helmet. Since the introduction of khakee in the hot months, and of san topees, the soldier's dress has been most suitable. The red serge tunic is also a great improvement on the tight shell jacket for the monsoon and cold season. The Commissioners do not suggest any improvement in the present dress, except in the bad fit of the men's boots, which is often a cause of lameness when on the march, and a consequent burthen on the sick carriage of the regiment.
Duties.	1. The men should be thoroughly drilled at home before being sent to India. 2. The men get up at daybreak, drill for an hour, and sometimes in the evening light, out at 9 p.m. in summer, and 8 p.m. in winter. The men do not suffer in health from drill. The best time for drill is early in the morning or late in the evening. There are several general orders on the subject, also limiting the duration of any parade to one hour. The average number of nights which the men have in bed is for Europeans 10 and natives 5. 3. The only permanent European guard is the quarter guard; but occasionally when there are prisoners in cells there is a cell guard. Guards mount for 24 hours; both are within 100 yards of the men's bungalows. There are four regular roll calls during the day, and in the hot weather every two hours, to ensure the presence of the men in barracks, and to prevent their exposing themselves to the sun during the day from 9 a.m. to 5 p.m.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of recreation and instruction at the station:—There is neither ball court, skittle ground, nor school; there is a small library and reading room, not lighted at night, but neither day room, soldiers' clubs, soldiers' gardens, workshops, theatre, nor gymnasia. The men have cricket things supplied from the head-quarters of the regiment, but Baroda not being a large European station, there is no gymnasium, the men play at cricket at the officers' gymkhana weekly. More means of recreation during the heat of the day are desirable. The commissioners would suggest an increase to the books of the library of a kind suitable for the soldier, and above all the establishment of workshops. 2. To increase the existing means of occupation, I suggest that workshops should be erected for different kinds of works, but particularly carpentry, and house joinery. Carpenters might earn 6 and 7 or 8 annas a day at this work, and be a saving to Government. 3. Soldiers' savings banks are instituted. 4. The means of amusement are not sufficient.
IX. MILITARY PRISONS.	1. The cells at the station, six in number, are very bad, all under one roof, and badly ventilated, in fact the doors cannot be closed during the day. The cells are so bad, that they are only used in extreme cases. Every cell should be separate and surrounded by tatties or mats of straw; and they should be in a prison yard, each having an iron grated door.
X. FIELD SERVICE.	1. There are no local medical regulations not included in the general presidency regulations. 2. Recommendations from medical officers as regards the conduct of the line of march are invariably attended to. 3. Encampments are directed to be on high open ground, to the windward of any village or swampy ground, and near water. Any medical officer making a suggestion has been attended to, as far as our experience goes. 4. No answer to this question.
XI. STATISTICS OF SICKNESS AND MORTALITY.	The following table gives the statistics of the station.

BARODA.—EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	QUEEN'S TROOPS.																					
1857-58	X Battery, Royal Artillery Detachment H.M.'s 4th King's Own Regiment Do. do. 72nd Highlanders Do. do. 86th Regiment	251	30	—	—	—	14	1	1	—	14	—	5	—	—	—	49	1	113	2	45·0	0·8
1858-59	X Battery, Royal Artillery K do. do. Detachment H.M.'s 33rd Regiment Do. do. 51st do.	283	561	6	—	—	43	1	9	1	92	—	35	6	—	—	248	—	988	14	349·1	4·9
1859-60	1/13 Royal Artillery Detachment H.M.'s 4th King's Own Regiment Do. do. 33rd Regiment	528	1,142	4	—	—	49	2	25	1	104	1	21	15	7	5	320	1	1,668	29	315·9	5·4

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per cent. to Strength. Treated.	Ratio per cent. to Strength. Died.
1850–51	1st Company 4th Battalion Artillery 6th Regiment Native Infantry 13th do. do. 17th do. do.	1,541	1,272	5	8	—	16	1	2	—	128	3	25	2	17	7	633	1	2,101	19	136·3	1·2
1851–52	1st Company 4th Battalion Artillery 13th Regiment Native Infantry 17th do. do.	1,583	1,165	11	4	—	21	1	2	—	70	2	6	—	2	—	417	3	1,687	17	106·5	1·0
1852–53	1st Company 4th Battalion Artillery 1st Grenadier Regiment Native Infantry 13th Regiment Native Infantry 17th do. do.	1,484	1,703	3	6	—	19	1	3	—	80	2	8	1	—	—	529	2	2,348	9	158·2	0·6
1853–54	1st Company 4th Battalion Artillery 1st Grenadier Regiment Native Infantry 17th Regiment Native Infantry	1,612	2,044	13	20	2	27	5	3	—	112	6	16	1	1	—	675	4	2,898	31	179·7	1·9
1854–55	3rd Company 3rd Battalion Artillery 1st Grenadier Regiment Native Infantry 17th Regiment Native Infantry 1st Company 4th Battalion Artillery	1,591	1,374	11	23	2	39	3	1	—	127	7	18	—	4	2	638	7	2,224	32	139·7	2·0
1855–56	3rd Company 3rd Battalion Artillery 1st Grenadier Regiment Native Infantry 8th Regiment Native Infantry 17th do. do.	1,449	1,123	6	5	—	48	1	6	1	127	3	15	1	—	—	598	8	1,922	20	132·6	1·3
1856–57	3rd Company 3rd Battalion Artillery 1st Grenadier Regiment Native Infantry 8th Regiment Native Infantry	1,490	1,500	8	18	—	44	2	5	1	101	1	37	—	2	1	661	2	2,368	15	158·9	1·0
1857–58	3rd Company 3rd Battalion Artillery 8th Regiment Native Infantry	620	413	—	9	—	18	4	7	—	79	1	11	1	—	—	561	2	1,098	8	177·0	1·2
1858–59	2nd Extra Battalion 8th Regiment Native Infantry	1,060	1,714	9	31	—	31	—	1	—	102	2	6	—	—	—	832	1	2,717	12	256·3	1·1
1859–60	1st Company 4th Battalion Artillery Detachment 10th Regiment Native Infantry Do. 14th do. do. 2nd Extra Battalion	1,026	1,538	4	10	—	25	1	1	—	125	—	7	1	6	1	672	2	2,384	9	232·3	0·8

By order of the Principal Inspector-General, Medical Department,
W. C. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay 22nd December 1860.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. A ground plan, and marginal sketch of the hospital is forwarded. 2. The hospital is to the east or to leeward of the whole station, but far removed from the bazaar. The whole surrounding country is covered with trees, hedges, and cultivation, and there are many trees in the vicinity. Its site is much too close to the river and to the horse lines. 3. The water supply of the hospital is abundant and good. 4. The refuse water is carried off by a barrel drain, and emptied into the river through a nullah, outlet 50 yards distant. 5. The wards of the hospital are raised 1½ feet above the ground; The floors are solid, and consequently there is no ventilation under them. There is no provision made for conveying away the roof water, but it flows off towards the river. The materials of which the hospital is composed are brick and mud, pointed with chunam. There are verandahs all round the building, from which sufficient shade is obtained, they being 8 feet broad. The verandahs are sometimes used for the sick to take exercise in. The hospital consists of one ground floor. TABLE of hospital accommodation:— Date of construction about 1826. Total number of wards, 4. Total regulation number of beds, 120.

Wards or Hospital Huts, Number.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			Ft. In.		Ft.	Ft.
4	30	98	22	14½	31,262	1,042	72	1 6	12	5	3

BARODA.
BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The hospital is not so placed as to receive the full benefit of prevailing winds; on the contrary it only gets the wind after it has passed over or through the whole station, which is, moreover, so crowded with trees as to render proper ventilation next to impossible. The windows open inwards, and should be much enlarged. 6. The means of ventilation in use in the wards of the hospital are the windows, doors, and ventilators in the roof. In the hot weather punkahs are pulled day and night. Altogether the means are sufficient. There are no jalousies or jhilmils. 7. The air of the wards is cooled by punkahs and kus-kus tatties. The punkahs are suspended from the ceiling, provided with a curtain loaded with shot or sand at the bottom, and pulled by a rope. Six punkahs are pulled by one rope. The tattie is applied to the windows, and kept wet with water, and the hot wind is thus cooled before entering the ward. Every window not having a tattie must be closely shut. 8. There are no means of warming the wards, nor are any required. The ceiling and walls of the wards are cleansed and whitewashed, whenever required by the medical officer. 9. The privies of the hospital are the same as those of the barracks, and are connected with the hospital by a covered way; they are properly cleansed, and are not offensive. 10. The washing arrangements of the hospital are very good, and there is a large room provided with ghindies, or copper washing basins, tinned. 11. There is a large tub in the washing room about 8 ft. by 3 ft., kept constantly full by a bheestie, for those men who are sufficiently well to avail themselves of it for bathing. 12. The washing and drying of the hospital linen is performed by dhobies; the means are quite sufficient. 13. The storage is sufficient and dry. 14. The bedsteads of the hospital are portable iron cots, with sacking lashed to them by rope, and on this a straw mattress. Coir is recommended for stuffing the mattresses in preference to straw. 15. The hospital kitchen, cooking apparatus, &c., are similar to those at the barracks, but on a smaller scale. The cooking is well done, and the means are sufficient. 16. Diet tables according to regulation. The forms forwarded are of two descriptions, those for the superintendent surgeon of the late company's service, and those for the deputy inspector-general of H.M.'s hospitals at army head quarters. 17. The provision for hospital attendance on the sick is as follows:—There is a corporal who acts as hospital serjeant to the detachment hospital, and four ward boys to attend upon the sick. In addition to this, a European orderly is provided for such men as are seriously ill, and need constant attendance, and where natives could not be trusted. In addition to these, who are termed second-class hospital servants, there is an assistant apothecary with the detachment corporal. 18. I think that the European hospital, taken as calculated to afford accommodation to the detachment, is in itself all that could be desired; but its situation in the lee of the whole station, and close to a nullah used as a necessary by the natives, and as a receptacle for the filth of the station, is most objectionable. During the cholera, which attacked the detachment in March last, the men were at once removed from it. 19. I know of no other deficiencies, but the grand defect of position just mentioned. 20. There is no stated ground in which convalescents can take exercise, nor are there any seats. Any exercise which they require they must take in the verandahs during the day, and in the evening in the hospital compound. There are a few convalescents who live in their barrack rooms, and have permission to walk about the station. 21. There is a female hospital for the soldiers' sick wives and children; but it has no matron or assistant matron. The few women and children of the detachment are therefore attended in their own houses. The present arrangements are sufficient. 22. There are no special local hospital regulations not included in the general presidency medical regulations. 23. The application of the medical officer, in all matters appertaining to the sanitary state of the hospital, is always attended to. 24. There is no ward or hospital for convalescents at the station, nor is any such required.
XIII. BURIAL OF THE DEAD.	1. The burial ground for British troops is 500 yards to windward of the station. 2. The area of the ground is 10,000 square yards; the soil is black, and decomposition takes place rapidly. The drainage is effected by a passage through the wall, made by leaving a brick out here and there; no regular drainage The ground is carefully kept. 3. Ample space is allowed as an interval between the graves, which are never on any occasion re-opened. There is no regulation depth of graves. The graveyard is not yet full. Interment is usual within 12 hours after death. There are no regulations as regards the burial grounds used by the native troops; the Jews and Mahommedans bury in their separate burial grounds, which are not offensive. 4. The graveyard is never offensive. As regards the burial of British troops, the practice is frequently to bury within 12 hours, if possible; always within 24. 5. The dead of camp followers are disposed of according to caste:—The Parsees expose to fowls of the air; Hindoos burn; and the Mussulmen bury. 6, 7. No injury from this practice accrues to the public health. There are no improvements to be suggested.

(Signed) J. McGRIGOR, Major, H.M.'s 30th N. I., Commanding station.
J. S. RIMINGTON, Assistant Surgeon, H.M.'s 30th Regiment, N. I.
A. R. KILROY, Assistant Surgeon, 33rd Regiment.
T. F. DOWDEN, Lt. Engineers.

4th September 1860.

POONA.

ACCOMMODATION

Queen's Troops	Artillery	- - -	591
	Cavalry are quartered at Kirkee.		
	Infantry	- - -	1,094
Native Troops	Infantry	- - -	1,996

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country surrounding the station is barren, with occasional patches here and there of vegetation and groves of trees. It is dry and undulating, and there are hills and spurs of ghats within distances of from 10 to 25 miles. There is no jungle in the vicinity, but occasional clumps of scattered bamboo and other trees. A river runs near the station, but is only visible where one is close upon it or from considerably elevated ground.
	2. The station is elevated about 1,800 feet above the level of the sea, but is on a level with the adjacent country. There is no higher ground adjoining the station which could be made available for military purposes of any moment, unless it might be the hill of Parbuttie on the other side of the city from Poona, which, as it overlooks the city, would be a valuable military point to occupy.
	3. The nearest mountain or table land is Singhur, about 13 miles distant. It forms a portion of a spur or range of hills running in an easterly direction from the Western Ghauts. Its height above the station is about 2,400 feet.
	4. The nearest water worth consideration is the river Mota Moola, about three-quarters of a mile from the camp. The vicinity is not liable to overflow, as the river keeps within its banks. The ground near the station is a flat, almost unbroken, table land of the trap formation. There is nothing in the form of ravines or waterpits productive of any ill effect on the health of the station.
	5. The station is open and freely exposed to the winds, and is not encumbered in any way with trees, hedges, gardens, &c., so as to interfere with either free external or internal ventilation. The temperature of the station is not raised by exposure to reflected sun heat, being too largely scattered for such a contingency. From November to February cold land winds prevail, with occasional sea-breezes; from March to June hot, scorching, variable winds, and for the rest of the year the prevailing winds are from the sea. The cold and rainy seasons are beneficial to the health of the troops, but in the hot season fevers and congestive visceral disease prevail.
	6. The surrounding country is chiefly uncultivated. Gardens and fields there are, but only where water is handy, and they may be said to be in patches. There are no works of irrigation near the station, and artificial irrigation being confined to garden cultivation has no appreciable effect on the health of the station. Rice is not cultivated in the neighbourhood, and the health of the station is not affected by the cultivation of indigo or the preparation of hemp or flax.
	7. The large native city of Poona, containing about 80,000 inhabitants, lies to the west and windward of the cantonment about three-quarters of a mile; in other words, the cantonment is on the wrong side of the city, which lies in a hole below the station. Besides this city there are two small villages, Wanoree and Ghorpooree, both so near the cantonment, especially the latter, that they are a nuisance. Last year the cholera first showed itself in Wanoree, which is only about 100 yards or so from the lines of the artillery officers. They should both be removed, the owners of the houses receiving ample compensation.
	8. The upper surface of the station is, generally speaking, of moorum, with patches of black soil here and there, and below trap rock. The station occupies new ground, i.e. it was first established 43 years ago, and had not been occupied before.
	9. Water is usually found in the dry season at a depth of about 33 feet below the surface, and during the rainy season at about 19 feet.
	10. The rain-fall and water from surface springs flows readily away, though some of it doubtless sinks into a pervious subsoil, whence it runs off into the river. The fact, that a few hours after heavy rain the ground is nearly dry, proves that the rain-water does not lie on the surface till it evaporates. No drainage of any consequence passes into the subsoil of the station; the natural nullahs run off the water into the river, which acts as a drain to the station.
	11. The water supply of the station is derived from one aqueduct, 51 wells, three tanks, and from the river, the water of which is forced by pumps into camp. The aqueduct has its source about a mile and a half from the south-east side of the camp; it runs through the cantonment, and terminates in one of the peits or streets of the city. In the hot weather it runs nearly dry, and is obliged to be fed by water from wells in the vicinity of the source. Some of the water is stored in open tanks. The three tanks in the cantonment have a surface area of 280,450 square feet, but the water is not drinkable. There is, besides, one tank in the civil limits, close to the camp, which contains a surface area of 69,800 square feet. The water is good for drinking at certain times of the year, but not in the hot weather. The following table shows the tank surface in camp and civil limits.

Camp tanks - - - - -	280,450	square feet.
Civil do. - - - - -	69,800	„
Total square feet -	350,250	superficial area.

Poona.
Bombay.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	The tanks are generally full from the setting in of the rains in June till the commencement of the hot season in March, when the supply of water steadily decreases. and in May they are generally dry. The civil tank, however, never dries up. The nature ot the plants and animals which the tanks contain is unknown. There are no tanks in camp containing drinking water, the civil tank is not used for bathing purposes. The tanks are not liable to pollution from leaves falling into them. There are no precautions against foul drainage or surface impurities passing into them; but the water is not used for drinking purposes. It cannot be said that either nuisance or malaria proceeds from any of the tanks within or without the station, owing to their having a natural base in the trap formation, and comparative freedom from alluvial deposit. 12. Between June and February the water supply of the station is obtained from an aqueduct, 51 wells, and three tanks, to an amount sufficient for the wants of the cantonment (the exact quantities cannot be stated), but during the hot weather, when many of the wells run dry, the water is forced up from the river by a bullock engine at the rate of 75,000 gallons per diem; but even this extra supply is insufficient to meet the demand. A better water supply for the station is absolutely necessary. The water is colourless, tasteless, and inodorous. It is soft, but its microscopic characters are unknown. The quality is good, but the present amount is insufficient. The following table shows the chemical composition of the water.

—	Moota River at the City Bund.				—	Mota Moola River at the Jamsetjee Bund.				
	12 G.	13 H.	14 H.	15 H.		16 G.	17 H.	18 H.	19 H.	H.
Date of Collection	Oct. 1855.	Jan. 1856.	March 1856.	May 1856.	Date of Collection	Oct. 1855.	Jan. 1856.	March 1856.	May 1856.	May 1856.
Specific Gravity at 60°	1000·0	1000·4	1000·6	1000·9	Specific Gravity at 60°	1000·0	1000·4	1000·25	1000·5	1000·3
Inorganic constituents—					Inorganic constituents—					
Chloride of Sodium					Chloride of Sodium					
„ Magnesium					„ Magnesium					
„ Lime					„ Lime					
Sulphate of Soda					Sulphate of Soda					
„ Magnesia					„ Magnesia					
„ Lime		(x)	5·95	6·90	„ Lime	(x)	2·97	2·05	2·10	1·66
Nitrate of Magnesia					Nitrate of Magnesia					
„ Lime					„ Lime					
Carbonate of Magnesia					Carbonate of Magnesia					
„ Lime					„ Lime					
Silica					Silica					
Organic matter in solution	(x)	(x)	1·61	1·69	Organic matter in solution	(x)	·59	·59	·85	·68
„ „ suspended	—	—	1·90	14·29	„ „ suspended	—	—	—	1·05	·14
Total solids	1·1	6·34	9·46	22·88	Total solids	1·2	3·56	2·64	4·00	2·48
Gaseous contents	—	—	—	—	Gaseous contents	—	—	—	—	—

The water in the wells is raised by common leather buckets, and taken away in leathern skins on bullocks or in skins on the backs of coolies (bheesties). Each private individual has his own bheestie, and each regiment its set of bheesties, whose duty it is to supply water daily as it is wanted. The aqueduct water is collected here and there in branch reservoirs, and is carried away as above described, but the supply is insufficient, and, excepting during the monsoon, has to be taken care of and not wasted. A detailed scheme, accompanied by plans and estimates, for bringing more water into the cantonment was framed by Colonel Hart of the Bombay Engineers, and long since submitted to Government. The amount estimated was rupees 4,49,463, four lacs, forty-nine thousand four hundred and sixty-three. The superintending engineer, Lieutenant-Colonel Munbee, states that the estimates have been sanctioned, but when the work will be actually commenced is uncertain.

13. There are no other topographical points calling for remark which bear at all on the health of the station.

14. New stations, whether on the hills or plains, are selected by a mixed committee, composed of the senior military authorities, executive engineer, and senior medical staff, who, after making inquiry into sanitary and other questions, communicate with the civil authorities, the final decision resting with the Government. Stations have hitherto been selected on the plains.

1. There is an observatory at this station under the charge of Assistant Surgeon Chapple, R.A., with two intelligent non-commissioned officers as assistants. The following are the instruments in charge:—

Anenometers	1
Pluviometers	2
Barometers, standard	1
Self-registering thermometers, maximum in air	1
„ „ „ in sun's rays	1
„ „ „ wet bulb	1
American clock	1
Hydrometer, Daniell's	1
Thermometer, standard in air	1
„ wet bulb	1
Self-registering thermometers, minimum in air	1
„ „ „ in grass	1
„ „ „ wet bulb.	

Glaisher's Tables and other books of instruction.

References to Subjects and Queries.	Replies.
I. Climate—*cont.*	2. Table of meteorological observations for four years, from 1st April 1856 to 31st March 1860.

Months.	Barometer Mean.	Mean Temperature.	Mean daily range.	Mean Maximum in Air Thermometer.	Mean Minimum in Air Thermometer.	Mean dry bulb Thermometer.	Mean wet bulb Thermometer.	Mean Sun Temperature.	Rain. Inches.	Winds. Direction.	Winds. Force in lbs. per sq. foot.	Days of Sunshine.	Remarks as to Cloud, Dew, Winds, Storms, &c.
January -	28·059	69·2	27·978	81·2	58·0	68·7	58·9	98·4	0.34	E.	0·43		Clear agreeable weather.
February -	28·033	73·4	27·932	87·0	62·9	75·7	61·0	106·5	0·00	N.W.	0·54		Clear, with fresh breeze.
March -	27·979	79·0	27·892	91·2	68·4	78·2	63·8	111·9	1·27	N.W.	0·81		Hot winds, disagreeable weather, rain.
April -	27·917	84·3	27·841	94·6	71·4	83·6	68·5	110·7	0·59	N.	1·37		Clear, moderate wind, slight rain.
May -	27·828	83·8	27·771	92·7	73·9	82·4	71·6	103·5	3·77	W.	2·35		Cloudy, high wind, and rain.
June -	27·799	98·0	27·756	84·7	71·8	79·1	72·3	95·0	2·78	W.	2·17		Cloudy, high wind, monsoon.
July -	27·780	77·3	27·738	80·0	70·3	76·1	72·0	91·2	8·57	S.W.	1·10		Cloudy, moderate wind, monsoon.
August -	27·830	75·3	27·773	78·3	68·7	74·3	70·7	89·1	7·27	W.	0·84		Cloudy, moderate wind, monsoon.
September	27·894	75·2	27·836	79·0	67·6	74·2	69·9	94·7	4·45	W.	0·81		Cloudy, moderate wind, monsoon.
October -	27·968	77·0	27·895	84·0	66·2	75·8	68·2	105·2	3·66	E.	0·55		Cloudy, with rain, fresh breeze.
November	28·038	74·7	27·950	83·2	61·3	73·7	63·1	102·9	5·50	E.	0·25		Slightly cloudy, light rain.
December	28·077	69·2	27·974	80·2	57·7	63·7	59·2	97·9	0·04	E.	0·57		Clear, light wind.

3. A reference to the preceding table will show the general character of the climate in every respect. There is almost a total freedom from fogs, and dampness is only observable during the rains, and mild in degree. Only garden irrigation and tree planting exist, and do not produce any perceptible influence on the climate. Dust storms are rare, only occurring just previous to the setting in of the rains, and not perceptibly affecting the purity of the atmosphere. The climate (a table land of the trap formation, elevation above the sea of about 1,800 feet) is most favourable to the health of troops. The diet, as per regulation, is found to be ample. The shelter afforded at present is partially good, but better accommodation is sanctioned and in progress. During the hot months the light khakee clothing should be worn; during the rainy and cold months woollen clothing, and always at night warm woollen covering is desirable, the latter owing to the great sensible variation of temperature between the day and night arising from atmospheric dryness. The most healthy months at this station are July, August, September, December, January, and February, and the most unhealthy, October, November, March, April, May and June. During October and November, owing to the cessation of the rainy season, with the elevated temperature, remittent and intermittent fevers, with visceral diseases, prevail; during the hot months of March, April, and May these, and also eruptive fevers, and congestive diseases of the cerebral, thoracic, and abdominal organs, and in June bowel complaints. Rheumatism prevails during the cold months.

4. There is no district near this station, the climate of which is more conducive to health than that of the station.

5. We have served in most of the stations in the Deccan, the southern Mahratta country, the Mhow division, Sinde, the Concan, and Guzerat. These stations in the Deccan being on an elevated table land of the trap formation, about 1,800 feet above the level of the sea, are the most conducive to the health of troops; next in degree those in the southern Mahratta country and the Mhow division from the same causes, next in degree those in Scinde; for though the elevation above the sea is slight, the country surrounding the stations is, for the most part, a sandy plain free from jungle vegetation. The stations in the Concan or coast border of the presidency are comparatively healthy, being situated within the full influences of the sea breezes, but are, however, subject to severe visitations of epidemic and zymotic diseases. With the exception of the Deesa station (salubrious from being situated in an open sandy plain) the stations in Guzerat are positively injurious, the elevation above the sea being very slight, and the soil alluvial, with a rich rank vegetation, and abounding in rivers with a small degree of fall, exhibiting extensive alluvial banks.

III. Sanitary Condition of Station.

1, 2, 3. General Maps of the station generally, with plans of the surrounding country and of the barracks are transmitted.

4. Table of Barrack Accommodation.

Barrack Rooms.	Regulation. No. of Men in each Room or Hut.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
Ghorepooree.				mean				ft. in.				
12 New Barrack Rooms	42	100	24	23	55,200	1314	57	1 4	26	5	3	Built in 1849.
12 Old Barrack Rooms -	40	97	24	15½	36,084	902	58	1 4	16	5	3	Built in 1842.
Wanowree.												
6 New Barrack Rooms -	96	110	25	37	101,750	1059	57	1 4	77	4	8	Built in 1859–60.
Horse Artillery.												
2 Barrack Rooms -	84	100	32	27	86,400	1029	76	1 4	54	5	3	Built in 1846.

POONA.
BOMBAY.

Table of Barrack Accommodation—*cont.*

Barrack Rooms.	Regulation No. of Men in each Room or Hut.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
GUARD ROOMS.												
Ghorepooree - - -	15	40	16	14½	9,280	617	43	1 4	3	3	5	Built in 1842. } Other guard rooms are similar in construction.
Wanowree - - -	15	40	20	20	16,000	1,066	53	1 4	2	3	5	Built in 1859. } Other guard rooms are similar in construction.
Horse Artillery - -	6	30	16	13	6,240	1,040	80	1 4	2	5	3	Built in 1851. } Other guard rooms are similar in construction.
28 Prison Cells - -	1	10	10	16	1,600	1,600	100	—	—	—	—	Built at various times.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	N.B.—There are six temporary chuppered buildings (barracks for the artillery) which will be pulled down when the new barracks, which have been approved, are built. There are also 14 chuppered barracks near the church (temporary buildings), erected in 1823; but they are to be pulled down on the completion of the 10 upper-storied barracks, of which six are ready.

5. The windows in the barracks are always on both sides (as are also the doors), which arrangement ensures some degree of ventilation. The windows open on hinges. In the upper-storied Wanowrie barracks there is a closed verandah, on both sides of the upper and lower rooms, 11 feet wide. The Horse Artillery upper-storied barrack has an open verandah on both sides, above and below, 8 feet wide; and the Ghorepooree barracks have open verandahs on both sides, averaging 10 feet in width (in the old barracks only 7 feet). The open verandahs are not used as sleeping quarters, and the closed verandahs of the upper-storied Wanowrie barracks only occasionally on emergency. There are jalousies in some of the barracks, and they are properly constructed.

6. The bedsteads used in the barracks are mostly boards and trestles, but there are iron bedsteads, with cross thin iron straps. The bedding for each soldier consists of 1 numda, 2 cumlie blankets, and 2 pairs of sheets, with 1 cotton coverlid, all supplied by Government. We have no improvements to suggest.

7. The following tables show the dimensions and construction of the tents used in camp.

TENT for EUROPEAN SOLDIERS, double pole.—Double poled, with fly and shed, and single set of walls.

Extreme length within - -	22 feet	For 14 Horse Artillery.
„ breadth „ - -	14½ „	or 22 Foot „
Height of walls - - -	12¼ „	or 22 Infantry.
„ to ridge - - -	12¼ „	or 16 Cavalry.
Total area - - - -	319 square feet.	
Cubic space - - -	2,393 cubic feet.	

TENTS for EUROPEAN SOLDIERS, single pole.—Single pole, with fly, shed, and single set of walls.

Extreme length within - -	14 feet	For 8 Horse Artillery.
„ breadth „ - -	14 „	10 Cavalry.
Height of walls - - -	6 „	or 13 Foot.
„ to cap - - -	12′ 2″	
Area - - - -	196 square feet.	
Cubic space - - -	1,268 cubic feet.	

EUROPEAN HOSPITAL TENT.—Double poled, with fly, shed, and double sets of walls.

Extreme length inside - -	22′ 9″	For 12 Europeans, or 15 Natives,
„ breadth „ - -	16′ 4′	
Height of walls - - -	6′ 3″	
„ to ridge - - -	12′ 9″	
This gives about - -	30 sq. ft.	Per European.
And - - - -	260 cub. „	

TENTS for NATIVE SOLDIERS.—Double poled, oval shape, with fly only.

Extreme length within - -	26′ 8″	For 25 Cavalry.
„ breadth „ - -	13′ 9″	or 30 Infantry.
Height to ridge - - -	9′ 6″	
Area - - - - -	383 square feet.	
Cubic space - - -	1,030 cubic feet.	

TENTS for NATIVE SOLDIERS, single pole.—Nearly circular, with bell-shaped fly only.

Diameter - - - - -	11 feet	For 12 Infantry.
Height to cap - - - -	10 „	
Area - - - - -	94 square feet.	
Cubic space - - - -	180 cubic feet.	

8. In the upper-storied Wanowrie barracks continuous ventilation is obtained by raising the upper part of the roof above the lower; the lower rooms are ventilated by a range of square holes contiguous to the floor of the upper rooms. In the other barracks there are only cowl ventilators, which are objectionable, as they always leak in the rains, and their weather sides have to be dammed up during the monsoon. Tents and guard-rooms require no extra ventilation than what they ordinarily possess by doorways and windows. The ventilation in all the barrack rooms is insufficient. Arrangements should be adopted (which the soldier

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	could not interfere with) for the free ventilation of the rooms when the doors and windows are closed. There are no means in use at this station for cooling the air admitted into the barrack rooms. 9. The barracks are constructed of brick and lime plastered; the roofs are double tiled, with teak trusses and rafters. Some of the barracks have paved floors, and all should possess them. 10. The floors (most of which, as before stated, are paved) are raised, on an average, about 3 feet above the ground, but there is no passage of air underneath them. 11. The materials of which the barracks, tents, &c., are composed are good; but the Committee are unanimously of opinion that in this country barrack rooms should be elevated above the ground at least 14 feet. Such an arrangements entails at all times a clearer and more healthy atmosphere for the soldier both by day and by night. The lower portion of the buildings might be converted into dining-rooms, washing-rooms, libraries, skittle-alleys, &c. &c. Most of the subsidiary detached buildings would thus be done away with, and no extra expenditure entailed. We also would strongly advocate for all new barracks the adoption of open verandahs; the men like them, and they add to the ventilation of the barrack rooms. The barracks and cantonment are kept in repair by the executive engineer. The repairs are mostly executed by native contractors, and often times delay is experienced in consequence of the natural dilatory disposition of the native, want of sufficient supervision, and other circumstances. No officer is responsible for the general sanitary state of the cantonment. The Committee strongly recommend that it should be the sole duty of a separate medical officer to attend the sanitary state of so large a cantonment (including Poona and Kirkee). The walls and ceilings of the barrack rooms are cleansed and lime-washed at intervals of three months, oftener if necessary. We would recommend that in future barrack rooms should be lime-washed "regimentally," and that lime, brushes, &c., should always be kept in store by the quarter-master. 12. The lavatories are merely open paved verandah rooms, with tubs placed in them amply supplied with water. The refuse water runs off into tubs placed outside. We would recommend that, instead, cut stone wedge-shaped cesspools, guaranteed against leakage, should be adopted; or perhaps large iron tubs, japanned or glazed, would be better still. There are two washing-rooms generally to each barrack room. 13. The regimental cook-room is a simple rectangular building, with an opening in the roof and walls for the smoke to escape. The fireplaces are nothing but masonry platforms about 2 feet high, with iron rests, called choolas, for the cooking pots. Water is supplied by the bheesties, and the refuse water is drained into cesspools, which are cleaned out nightly by halalcores or sweepers. Large iron japanned-glazed tubs would be better still. The washing and drying of linen for the soldiers are satisfactorily effected by dhobies employed regimentally. 14. The privies for Europeans are simple buildings, and will be easily understood by the sketch transmitted. The filth falls into baskets and is carried away by sweepers, the urine draining into cesspools. The privies for native soldiers are also enclosed buildings. The sweetness or otherwise of these places depends entirely on the sweepers and a liberal supply of deodorising materials. Pans similar to those recommended for the cook-rooms would be better than cesspools. 15. The means of ventilation have been described. None of the buildings above-mentioned are lighted at night except the barrack-rooms. These latter are not sufficiently lighted, and very great difficulty has been experienced in trying to remedy the evil. We would recommend that similar lanterns to those used on board of Her Majesty's troop ships (swinging lamps and deck lamps) should be introduced as an experiment. 16. There are no arrangements at this station for draining and sewering the barracks, but all deposits, waste water, filth, &c., &c., are removed to a specified locality by the sweepers. This system of removal under the existing arrangements is found to answer. The barracks and hospitals are never damp except in the rains, when artificial means, such as pans of lighted charcoal, are placed in the rooms for as long as may be deemed advisable or necessary. There are a few small cesspools, about $3' \times 3' \times 3'$ here and there, but they are daily cleaned out. They are not in the vicinity of any wells. There are no foul ditches near the station. 17. The surface cleansing of the cantonment is well attended to. The refuse, manure, &c., is carried away in carts and burnt in a filth-burning kiln situated at the south-east end of the camp. 18. The surface of the cantonment is kept free of vegetation. There are no old walls, and the hedges in the camp are kept cut to a certain height, so as not to interfere with the ventilation of the station. We would recommend that householders should be forced to remove these hedges, and substitute low masonry or brick walls. We are also of opinion that all hedge-rows, outside but in the vicinity of the camp, and on either side of the road from Poona to Kirkee, should never be allowed to exceed 3 feet in height. 19. The bazaar is not well drained, nor can it be so until the supply of water is better than it is at present. The ventilation of the bazaar is pretty good generally speaking, but when the poorer classes, such as hamals, dooly-bearers, beggaries, &c., are congregated, better ventilation is desirable, and could be obtained by extending the bazaar. The water supply is not sufficient in the hot weather months, but this will be remedied if Colonel Hart's scheme is carried out. The bazaar is kept very tolerably clean. Latrines and privies for the use of the inhabitants of the bazaar are much needed, as at present the poorer classes are obliged to go to a considerable distance to attend to the calls of nature. The establishment to superintend the cleanliness of the bazaar consists of one havildar, one naique, and 20 peons. Under their superintendence are employed one muccadum, eight sweepers, and six carts. The duties of these are to daily collect and carry away the rubbish and filth of the bazaar to selected places. This establishment is far too small, and should be increased. The population consists of 27,000 inhabitants. Men are also employed, exclusive of the above, to keep the lanes in repair, cutting down prickly pear hedges, and cleaning drains, &c. The provost sergeant and the kotwals see that the above establishment do their duty. The houses of the merchants and shopkeepers in the bazaar are generally of a good description and roomy. The houses of the labouring classes are principally made of mud bricks dried in the sun, with grass chuppers for roofing, but these are gradually giving place to better buildings with tiles. There are no dung-heaps within them, as they are not allowed. It must be remarked, that when the bazaar was first formed in 1819 no attention was paid

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	to regularity of streets and houses, but people were allowed to retain the spots of ground where they had first squatted after the battle of Kirkee and Poona, in 1817. The Sudder bazaar is in front instead of rear of the officers' quarters and the cantonment, which is most objectionable. No nuisance is experienced in barracks from wind blowing over the native dwellings, except in the cases of the villages of Ghoreepoore and Wanowrie. Their contiguity to the station is the cause of this nuisance, and nothing but their removal will eradicate it. 20. The slaughter-house is at present within the cantonment, but it is shortly to be removed to a convenient place, about two miles from the centre of the camp. All slaughtering is ordered to take place during the night, and the offal to be removed to the filth burning kiln. The present slaughter-house is found to be a nuisance, and hence the necessity for its removal. 21. The bazaar horses for hire (saddle) are picketed in the horse lines between the centre street and Malcolm Tank road, and are to the number of about 20. The lines are kept clean and in repair by the owners of the horses, under the direction of a head man or muccadum. The manure is carted away by the surrounding gardeners, tile makers, &c., or taken to the jungle. All the manure is cleared away daily. The horses for carriages to the number of about 75 are kept in stabling in the bazaar. Horses for private purposes are kept in stabling in the compounds of the house owners. The manure is disposed of as above stated. 22. The horses of the cavalry and artillery are picketed in the open, in lines constructed for the purpose to the eastward of the men's barracks and hospitals. The manure is removed daily. In the picketing grounds the horses are eight feet apart, arranged in rows, and are about a quarter of a mile from the nearest hospital and barrack-room. 23. There are sufficient quarters provided at this station for the families of married soldiers, none of whom occupy barrack rooms with the men.
Officers' Quarters.	1. Officers live in separate private bungalows, situated in compounds, averaging 100 yards × 80 yards, and arranged conveniently with respect to the soldiers' quarters. We have no improvements to suggest further than that it would be advisable that several ill-conditioned houses in this cantonment should be pulled down and a better class be erected in their stead. We do not advocate officers' quarters in this country.
IV. HEALTH OF THE TROOPS.	1. The station, surrounding district, and adjoining native population are healthy. 2. Spleen disease is very rare at this station. At the setting in and termination of the rainy season, bowel complaints and fevers of the remittent and intermittent types prevail; during the hot season eruptive fevers, particularly variola, varicella, and rubeola, and during the wet and cold season catarrhal and rheumatic affections. 3. I attribute the healthiness of the neighbouring native population to elevation, the trap formation of the surrounding country, freedom from alluvial deposits, the general prevalence of westerly or sea breezes, and good water. 4. The stations at which the troops at this station were located before arriving here are as follow, viz., Her Majesty's 4th troop Bombay Horse Artillery, last stations, half troop at Sholapore, and half troop at Kolapore. The troops stayed at these stations for six months, and left for this on the 4th February 1860. The state of their health there was good, and the disease from which they chiefly suffered was intermittent fever. They arrived in Poona on the 18th and 22nd of February 1860 in a good state of health, and the diseases from which they have suffered since arriving are fever and stomach and bowel complaints. Royal Artillery, No. 1. battery 13th brigade, was quartered at the Cape of Good Hope, and No. 7 battery, 13 brigade, in England. The former battery had been two years at the Cape, but the latter had been always in England. The former left the Cape in September 1858, and the latter quitted England on the 10th August 1858. The health of both batteries was very good; a few of the ordinary cases of sickness only in hospital. The date of arrival in India of No. 1 battery was 10th November 1858. It was then stationed a short time at Baroda, where the men suffered from sun stroke and fever; but since their arrival in Poona their health has been good. No. 7 battery arrived on the 8th of September 1858, and though many of the men have suffered from cholera, the health of all now is good. Her Majesty's 56th Regiment was at Belgaum two years, and left on the 21st February 1860. The health of the men there was good; the prevailing diseases were fevers, hepatic, stomach, bowel, venereal, and rheumatic affections. The regiment arrived in Poona on the 23rd March 1860, in an unhealthy state, from cholera and bowel complaints, but their health has much improved since their arrival here, the prevailing diseases now being ephemeral fever and mild bowel complaints. Her Majesty's 57th Regiment was stationed at Ahmednuggur, with detachments at Aden, Sattara, and Mulligaum. They were at Aden two years and nine months, and at the other places about 10 months. They left Aden in December 1859, where the health of the men was good, and the prevailing disease venereal affections. They arrived in Poona on the 15th March 1860. Head quarters left Ahmednuggur in January 1860, at which place their health was very indifferent from intermittent fevers, and arrived here in the same month. Since their arrival here their health has much improved, and the prevailing diseases of the united corps now are ephemeral fevers, bowel and rheumatic complaints. Her Majesty's corps of Sappers and Miners, Indian army, head quarters stationary. The health of the men of this corps is good, and the prevailing diseases are fevers and bowel complaints. Her Majesty's 15th Regiment Native Infantry were at Kolapore for about 18 months, and left it in wings, the right in October 1859, arriving in Poona in November, and the left in March, arriving in April 1860. The health of the men, both before and since their arrival here, generally good. The prevailing diseases are mild fevers and bowel complaints. Her Majesty's 25th Regiment of Native Light Infantry arriving in Poona in March 1859, after nearly two years field service in Central India. They were very unhealthy from scorbutus and general cachexia; but the health of the men has much improved since their arrival here. The prevailing diseases have been fevers and bowel complaints.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	No portion of the men's present accommodation at this station is more unhealthy than the rest, all being alike healthy. 5. Troops at this station are not camped out during any portion of the year. 6. We have never been in charge of troops at hill stations, but the following replies are founded on the opinions of C. Morehead, Esq., M.D., late acting superintending surgeon at Poona, published in the "Transactions of Bombay Medical Society." His experience and researches are favourable to the residence of troops in hill stations, provided the proper season is chosen for sending troops, and if sick or convalescent that a proper selection is made. His experience is founded on personal knowledge, and the reports of medical officers stationed at Malcolm Pait, on the Mahableshwur hills, and at Poorundhur. 7. Dr. Morehead states:—If the debilitated soldier who in the plains would recover his health and strength slowly after the removal of positive disease will, by commencing a residence on the hills in October, or during the hot months, having become fitted for duty, be less liable to fresh attacks of disease, and when attacked the disease will be of a milder type; whereas, on the other hand, the continued residence in the plains leaves him predisposed to attacks of the severer forms of disease—the ultimate effect of a freer use of hill climates must be to reduce mortality and invaliding. He disapproves of sending troops during the cold or rainy months, if sick, as liable to be injured by a return of former diseases. 8. Hill stations should most decidedly be selected for troops, but only as a change of climate. 9. Convalescents sent to the hills in the cold and rainy seasons are liable to recurrences of organic visceral disease. Again, if troops go to them exhausted by service in the field they are liable to congestive, inflammatory, and organic visceral disease, but otherwise they are only subject to mild hill diarrhœa, and the general effects of a rarefied atmosphere. 10. With respect to the precautions necessary as to diet, clothing, shelter, duties, &c., &c., no data are given by Dr. Morehead's report; but the inference is clear, that as there is liability to the formation and recurrence of visceral disease, cerebral excitement, and other complaints of the sthenic type, the diet should be of a non-stimulating nature, the clothing adapted to a climate much cooler than the plains, the shelter affording perfect protection from fogs, rains, and the direct rays of the sun, and the duties and exercises depending upon the improving health of the soldier. 11. From the reports of the medical officers of the Deccan hill stations it appears that from the commencement of the month of March to the middle of the month of November the greatest advantage to health will be gained by the debilitated or convalescent from disease at Poorundhur. The rainy portion from June to October is inapplicable to Malcolm Pait. The healthy soldier may reside with advantage at Poorundhur or Pauch Gunny at any season. As far as practicable all ailing men should be afforded one month's residence in hill stations, but the period required for complete restoration of strength will vary in different cases, and its determination should be left to the discretion of the medical officer in charge of the sanitarium. 12. Applying the question of length of residence in hill stations to the hills of the Deccan, as affecting the health of troops returning to the table land on which the military station is situated, or to other stations in this presidency, Dr. Morehead states that the hill climate, from the middle of November to the end of February, might not prove injurious. Still, it possesses no advantages over that of the Deccan, and that season is most suitable for return to all stations in the plains. 13. Proper selection of period and good ambulance are the precautions required for protecting the health of troops on leaving hill stations for the plains. 14. In answer to this query, Dr. Morehead says, the question has been often raised, Would a regiment fresh from England, located at an elevation of, say 7,000 feet, retain its European vigour? Doubtless it would, a deduction being made for a rarefied atmosphere; but this regiment would not be efficient for the contingencies of service in India. If suddenly called to the plains for service in the hot season, it would show a heavy sick-list, and a rapid loss of vigour and stamina would ensue. But an improved state of general health will accrue to the soldier in India from an improved sanitary system, including the avoidance in the hot season of the heat of the plains by a more extended resort to hill stations. The maintenance of the greatest degree of health and efficiency for the ordinary contingencies of service in a tropical country is to be attained by avoiding as much as possible unhealthy localities and seasons, such as localities with malarious characteristics, the hot season all over India, and the rainy season in many parts of it. These points attended to, frequent change of service in the plains, which is most harassing to the soldier, will be quite unnecessary, and can only be deemed even advisable when troops are located in unhealthy districts. 15. The amount of accommodation in barracks and hospital at the hill stations is quite insufficient. There are two recognised sanitaria in the Deccan, Malcolm Pait, established in 1828, and the hill fort of Poorundhur, in 1852. European troops have not been located at the former, but there are Government quarters for 16 sick officers, and 77 private bungalows. Upwards of 300 visitors resort there annually, with such a favourable result to health, that with proper barrack and hospital accommodation it might be rendered an equally favourable sanitarium for troops, except during the rains, when the fall of rain, about 240 inches, renders it uninhabitable; but a distance of 10 miles on the eastern slope Pauch Gunny, at about 500 feet less elevation, with a fall of only 80 inches, would render this circumstance avoidable. At Poorundhur there are 2 barrack rooms, affording accommodation for 100 men, and a very good hospital adapted for 40 sick. There is also a patchery for 10 families, and a small female hospital. The sanitarium may at present be considered sufficient for 130 soldiers and 10 families. 16. Experience shows that an average height of 4,000 feet above the level of the sea affords the most suitable site for a hill station. 17. Poorundhur, about 20 miles distant from the station, is the nearest higher ground. Its means of access are very indifferent. Its elevation is 4,200 feet. There is much atmospheric dryness in March, April, and May, and the rain-fall during the rainy season is 72 inches; it is then frequently enveloped in mist. Its mean temperature in the cold season is 67°5, in the hot season 75°5, in the rainy season 67°4, and in October 69°6.

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	18. Surfaces of the trap formation, as in the Deccan generally, also, where sand, with the detritus of metamorphic rocks prevail, are the most healthy; where the surface is alluvial, of the peat formation, as black soils, the most unhealthy, as in Guzerat. 19. Soldiers should on no account proceed to India earlier than 20 years of age, and should land there at the commencement of the cold season, viz., November. Troops in this presidency, when landed in Bombay, are first located in barracks situated either in the centre of the fort or at the end of a spit of land "Colaba," both of which sites, and the nature of the barracks, have been repeatedly condemned as most unhealthy. Their clothing, drills, and marches are according to the season, and the duties are excessively heavy for troops on arrival in such a depressing climate as that of Bombay. If recruits arrive early in the cold season they should be at once drafted to their respective regiments as soon as they have been properly equipped, otherwise to be at once removed to the table land of the Deccan, and to remain there till the opening of the next cold season. 20. Troops should be sent direct from the home depôts, so as to arrive early in the cold season. Regiments on their arrival in Bombay should commence their tour of service on the Deccan table land as far as practicable. 21. Troops are transported from Bombay to the centre of the Deccan table land by railway and from thence to the different out stations by bullock train or marches. The precautions to preserve health are marching in the cold season; marches not exceeding 12 miles, made between 2 and 7 a.m.; halting every fourth march one day; careful selection of encamping ground as regards soil, good water, avoiding the neighbourhood of large native towns on account of the probable presence of epidemic disease; good tents, not crowded, with tarpaulins for the floors: coffee before starting; and no grog before the first meal. 22. A British soldier should not serve in India for a period exceeding 12 years. 23. The invaliding boards in this presidency are composed entirely of medical officers. There is no conflict of opinion as regards invaliding; but we would suggest that these boards assemble oftener, to afford more frequent opportunities for the sick soldier to be sent home. 24. Invalids should leave India for home in January or February, which are the most favourable months, and not later than the first week in March, so as to insure their arrival in England in June, and secure a favourable passage.
Diseases.	1. There are weekly inspections for Europeans in the morning for the discovery of incipient diseases; but none in the native army, as it would offend the prejudices of religious caste. 2. Scorbutus is almost unknown in this station, either in the European or native regiments. Her Majesty's 25th Regiment Native Light Infantry arrived here in March 1859, suffering severely from this disease, the result of privation and fatigue on field service in Central India. Its effects in about a twelvemonth almost disappeared. No special preventive measures are necessary. 3. The proportion of hepatic disease among European troops is about 1 in 17. It is caused by the climate and intemperance, and is almost always idiopathic. The prophylactic measures necessary to diminish its frequency are strict attention to the wearing of flannel next the skin, moderate exercise, and the limited use of fermented and spirituous liquors. The native portion of the army is almost entirely exempt from this disease, which is to be ascribed to their abstinence from spirituous liquors, and their simple diet. 4. The Europeans are almost free from dracunculus at this station. Among those in whom it has appeared it originated in other stations. The proportion of cases of this disease depends on locality, and may be traced to bathing in and drinking tank water subject to fluctuations in depth, and extent of water surface, and alluvial deposit. In this station the annual number of admissions in a native regiment is about $1\frac{1}{2}$ per cent. 5. The proportion of constantly sick from venereal disease to the total sick in hospital from all other diseases is about 14 per cent. among the European troops, and 3·5 per cent. among the native troops. To diminish the liability of the soldier to these diseases a strict examination should be made from time to time of the prostitutes, and the removal of the diseased women from the bazaar. The establishment of lock hospitals would be highly advantageous to the health of the army. 6. The troops at this station suffer from diseases chiefly of the endemic class. The diseases named below are rarely epidemic at this station:— *Fevers* of the ephemeral and intermittent classes are the most prevalent, then those of the remittent type. Simple continued and typhoid fevers are very rare. *Dysentery* and all bowel complaints are prevalent at the commencement and during the rainy season. *Cholera*, as an epidemic, rarely occurs at this station; it prevailed as such at the latter end of May and during June 1859 among the European Troops in the barracks and lines on the southern border of the camp. Sporadic cases occur annually at the same season among the Europeans and natives. *Small-pox*, chicken-pox, and measles prevail among the native population during the hot season. Small-pox rarely appears among the troops, European or native, or their families, owing to the careful practice of vaccination. *Rheumatism* prevails among the European troops, chiefly with a venereal taint. Among the native troops lumbago, arthritis, and idiopathic rheumatism occasionally appear. The proportion which admissions and deaths from these diseases bear to the total admissions and deaths is as follows:—Europeans, total admissions, 1,478; total deaths, 20.

Diseases.	Admissions.	Deaths.
Fevers (present)	1 in $4\frac{107}{158}$	1 in 10
Dysentery	1 in 82	1 in 10
Cholera	1 in 164	1 in 5
Small Pox	1 in 739	None.
Rheumatism	1 in $14\frac{1}{3}$	None.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	In a native regiment of average strength, 650, total annual admissions, 350; total deaths, 5.

Diseases.	Admissions.	Deaths.
Fevers (present)	51·4	1
Dysentery	2·5	None.
Cholera	0·5	"
Small Pox	0·5	"
Rheumatism	2·8	"

7. The most frequent zymotic diseases are fevers of the ephemeral, intermittent, and remittent types, dysentery, diarrhœa, cholera, rheumatism, syphilis, and eruptive fevers. During the hot season the eruptive and other sorts of fevers prevail, and during the rainy season cholera, bowel complaints, and rheumatism. Intermittent and remittent fevers, together with rheumatism, are prevalent in the cold season. The eruptive and other forms of fever are, in the hot season, accompanied by scorching winds, with occasional thunderstorms and heavy showers of rain. For diseases of the rainy season the causes are apparent. The diseases of the cold season are accompanied by much dryness of the atmosphere and variation of temperature. These diseases do not prevail in one part of the camp more than another, except fevers of the eruptive class and bowel complaints, which prevail most in the bazaars and where natives reside, owing to the general unsatisfactory sanitary state of the bazaars, the want of ventilation in, and crowding of the native dwellings, bad drainage, and deficient water supply. The European troops at this station exhibit no particular predisposition from personal habits or condition to these diseases. The poorer natives occupying small huts or otherwise crowding together, and having a national objection to the admission of air and light into their dwellings, are, from these causes, sufficiently predisposed to the above diseases, especially among the lowest castes, owing to their filthy habits of living and eating.
8. The prevalence of epidemic disease is influenced on the march and in the field by curiosity and other causes, inducing both Europeans and natives to go into the towns and villages near the camp, where epidemic disease is generally prevalent, their careless exposure to the mid-day sun, even when exhausted after the march, and their drinking the roadside water. In cantonments there is nothing in their duties or occupations to render them liable to this class of disease, precautions being taken to prevent their appearance.
9. There is no record in the camp of the trial of small doses of quinine as a prophylactic against malarial diseases.
10. Epidemic diseases very rarely prevailing among the troops at this station; it is not apparent that any permanent measures are required for their prevention or mitigation.

V. Intemperance.

1. The soldiers at this station are temperate, the proportion of confirmed drunkards being about 1 in 200 or ½ per cent.
2. The proportion of admissions into hospital from diseases caused directly by intemperance is 1 in 113, and indirectly from such cause 1 in 28. No statistical records of the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime, being kept in European hospitals, the Committee are unable to furnish a satisfactory reply on this subject. Drunkenness is always punished as an offence.
3. Distilled spirits are sold at the canteen as furnished by the commissariat department, but are forbidden for the soldier in the bazaar. The quality is good, and the amount sanctioned is one dram per diem, of which two-thirds only is generally consumed. Spirit is no part of the soldier's ration at this station, but is so, at the option of the soldier, on the march and in the field. The quality is good, and the allowance is two drams per man per diem. It is not a habit to give a dram before morning parade. Spirit is not given to convalescents. No drinks, other than intoxicating drinks, injurious to health are sold in the canteens, and precautions are taken to prevent it in the bazaar.
4. Spirit, if taken in moderation, is not injurious to the health of the men, or injurious to the efficiency and internal discipline of the corps.
5. As regards a ration of spirits it is seldom given in cantonments; while on the march, when porter or beer are not procurable, we consider spirit advantageous. We do not recommend to abolish the sale of spirits in the canteen. In the bazaar the sale is prohibited, but it is found impossible to prevent the sale in an underhand way. We would rather wish to see the canteen system thrown more open to the soldiers after certain hours of the day, and allow them to obtain spirits, wine, or beer in moderation, to be drunk on the premises, and to do away with the present system of "calling the roll of different companies, for the men "to come to the table and swallow down at a gulp their allowance." The canteen might be conducted as in England, with tables, and forms, where a soldier might call for what he wants and sit down and drink it at his leisure. This would, we are convinced, check the demand on the unlicensed seller in the bazaar, and the disposing of his unwholesome and diabolical liquor.
6. The use of malt liquors or wines are, to a considerable degree, less likely to produce visceral congestion, the fertile source of all tropical disease, than spirits, as the latter produce the same effect on the system as the elevated temperature of the tropics.
7. Coffee, tea, lemonade, &c., are much used at this station, but there are no data in existence on which to offer a satisfactory opinion as to their influence on health, efficiency, and discipline, as compared with spirits and malt liquors.
8. The spirit ration no longer exists in cantonments; porter is given as a substitute, with benefit to the health of the troops.
9. It would not be advantageous to prohibit the sale of spirituous liquors in the canteen, but it is very desirable that good malt liquor, coffee, tea, &c. should be sold as well.
10. We have no additional recommendations to make on these points.
11. The orders and regulations for the supply of liquors in the bazaars to natives, as also the license granted to European shopkeepers, are seldom infringed, the penalties being very heavy, when any parties are convicted of having surreptitiously sold any liquor otherwise

References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	than as the regulation provides. No liquor is allowed to be given or sold to any European soldier, their wives or children, in the bazaar. All classes of natives who act as soldiers' servants must drink their liquor at the shops, and for this observance the kelals are held responsible. Liquor sellers have to purchase their supplies from the liquor contractor, and no other person. No liquor is allowed to be brought into camp without a pass, nor is any allowed to be sold except between the hours of six o'clock, a.m. and 8 o'clock p.m.
VI. DIET.	1. The ration for Queen's British troops and European troops in the Indian Army is the same, and is composed as follows: 1 lb. bread, 1 lb. meat, beef, twice a week mutton; 4 oz. rice; 2½ oz. sugar; $\frac{5}{7}$ oz. tea or 1$\frac{2}{7}$ oz. coffee; 1 oz. salt; 1 lb. vegetables, according to the season, but at all times ½ lb. of potatoes; 3 lbs. of firewood. The soldier has three meals per diem. The only periodical changes are in vegetables. Prior to their issue the rations are inspected by the officers on duty agreeably to Her Majesty's Regulations, by the quarter-master, and occasionally by the commanding and medical officers. 2. A complete ration, with a due proportion of vegetables, is issued to the soldier daily, but fruit does not form any portion of it at this station. The stoppage for this ration is 3 annas 4 pie daily. The soldier has three meals per diem, viz.: breakfast, at 8 a.m., of bread and tea; dinner at 1 p.m., and composed of meat and vegetables, cooked as most agreeable to the men, as curried, stewed, or roasted, and the evening meal, at 6 p.m., of bread and tea. The proportion of vegetables which enters into the ration varies according to the season, but at present the 1 pound is made up as follows: viz., ½ lb. potatoes, ¼ lb. cabbage, and ¼ lb. onions to each man. 3. The ration being so ample we have no suggestions to offer. To prevent the troops from disposing of any part of the rations precautions are taken by a non-commissioned officer being made responsible for them until they are served out to the men at the hours appointed for meals. 4. The means for cooking available at this station are of the most simple description; large and small copper vessels, tinned twice a month, and oftener if necessary, resting on iron stands over wood fires, and a spit for roasting. Permanent brick ovens are supplied in some barracks, but are not generally used. The kitchens are not sufficiently large, and, being over-crowded by native cooks, are not so clean, light, or well ventilated as they should be. They are sufficiently supplied with water. The food is boiled, roasted, and fried according to the option of the different messes. The ration is also occasionally made into curry. The cooking is properly done and sufficiently varied. Tea and coffee are properly prepared. Coffee is prepared by a canteen man before a march, and is supplied, on payment, to any of the men who may desire it. 5. Gardens for the cultivation of vegetables by soldiers could be advantageously established near the station as a recreation for the men.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements at this station are composed as follows: a wicker helmet, made in India, with a turban; a forage cap (English); a tunic, cloth, and one of serge, alternate years; black cloth trousers (English); blue size trousers; six calico shirts; six pairs socks: two suits of khakee clothing; three pairs boots (1 pair English every year); three flannel waistcoats, and two flannel belts. The accoutrements as in England. With the exception of the cloth tunic and trousers, which we consider made of too heavy a material, we think the present dress is suitable to the climate; they should be made of a light material. When the troops are on field service during the hot season they should be supplied with cumberbunds as a protection to the spine and stomach from sun heat. The guard dress from 1st October to 15th June is khakee clothing by day; but at night black or blue trousers, with red serge tunic, occasionally changing to the cloth tunic on cold nights. From 15th June to 30th September red serge tunic with black or blue trousers, both by day and night. The greatcoat is taken on guard and worn when desirable, and the men mount with packs, but do not carry them on sentry. There are permanent guard rooms with sun-shades for the sentries large enough to walk about under.
Duties.	1. Soldiers should not be sent to India under 20 years of age. They should be thoroughly drilled at home, and the more they know of their duty the better. 2. The soldier at this station rises at 4.30 a.m. in the hot weather, and goes on parade about 5 a.m., with a half to one hour's drill or inspection parade with or without arms. In the cold season he rises about 5.30 a.m., drills and parades till 7 or 8 a.m., according to circumstances. Evening parades are from 5 to 6.30 p.m. Every attention is paid to the health of the soldier, and seldom does a commanding officer distress them at drill. We do not consider their health suffers from the routine of duties or drill in the garrison. The best time for drills and parades is early in the morning, and from 5 to 6.30 p.m., and marches should generally be made during the night, so as to arrive at the halting place by about half an hour after sun-rise. Orders are invariably issued, drawing the attention of the commanding officer, that the men never be kept out in the sun. The average number of nights the men have in bed here during the week is between four and five. 3. The most distant guard from the lines is about a mile and a half. The guards mount at sun-rise for 24 hours. Roll calls are made by companies at breakfast, dinner, and tattoo. There are none at night, as a general rule, but occasionally, if required. The men do not appear to suffer from the night duty. The men always take their bedding on guard with them, and it is carried by coolies, who are paid from the canteen fund. Boards and trestles are provided in each guard room.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation:—There is a ball court, one skittle ground, and another sanctioned; schools, with good schoolmasters, and a library and reading-room, but these latter being at this station attached to the schools are on that account objectionable. They are sufficiently lighted at night. There are neither day-rooms or soldiers' clubs, soldiers' gardens, workshops, theatre, or gymnasia at this station, but the three latter are much needed. At present the means are not sufficient to keep the men occupied during the wet season and heat of the day, but if the deficiencies were made good we hope they would prove ample. The men are not allowed to expose themselves to the sun between the hours of 8 a.m. and 4 p.m. The medical officers are of opinion that the health of the men has not been affected by unnecessary exposure to the sun and rain. 2. Every means should be taken to afford places of amusement; a room should be set apart for a theatre, and a reading-room separate from the school-room, as it is found inconvenient to

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	have them combined. If the fives court were covered in it would afford amusement during the day, and also be suitable for rackets. A skittle court is highly desirable. A workshop for men to follow their trades is absolutely necessary, and every facility should be afforded to the industrious soldier to follow his trade. At present they have no means for such employment and of assisting their comrades. Gardens would prove advantageous as a recreation. 3. A savings' bank exists here, and is much approved of by the soldier who has any tendency to lay by any of his earnings. 4. There are merely open verandahs to some of the barracks, which are made available for exercise, and we would insist on the adaptation of open verandahs to all barracks and other military buildings at this station. There are no trees or shade sufficient for the purpose of taking exercise.
IX. Military Prisons.	1. There are no military prisons, and we would strongly suggest the adoption of one at this station for the troops of this division. The cells are sufficient in number, and we have no objection to offer relative to their effect on the health of prisoners; but as regards prison discipline they are very deficient in arrangements and detail. If they are retained a house is required for a provost serjeant, a wall with railing to encircle them, a guard-room at the entrance, and a shed for exercise and drill. A cook-house and privies are absolutely needed.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2. According to the existing regulations in the local army, medical officers can only make recommendations; it rests with the military authorities to carry them into effect, the medical officer having no authority *per se*. By the new medical code of the royal army these duties are much better defined. 3. The selection of encamping grounds rests entirely with the Quartermaster General's department; the medical officer can only (on arrival of the force) suggest or recommend; in the same way with the general arrangements for cleanliness, &c., there being no general sanitary regulations on the subject in the local army. When troops are marching, and more than one medical officer is present, one should accompany the officer of the Quartermaster General's department to assist him in the selection of the site and general sanitary arrangements of the camp, with power (if they differ) to refer personally to the decision of the commanding officer. Instructions and rules as to choice of proper sites, water soil, sanitary regulations, &c. should be published as means of guidance. Water is supplied to the men by puckal bheesties, to the hospitals by a permanent establishment, according to strength. 4. All arrangements and regulations with respect to field hospitals, ambulances, &c., will be found on a reference to the general presidency regulations, and the medical codes of the royal and local armies, all of which must be in the office of the Secretary of State for India.
XI. Statistics of Sickness and Mortality.	The following are the statistics of the station:—

POONA.

European Troops.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1850-51	H.M's 83rd Regiment	1,117	340	2	1	—	90	1	39	—	392	21	21	—	1	—	863	2	1,747	26	156·4	2·3
	„ 86th Do.																					
1851-52	„ 86th Do.	1,089	450	1	1	1	79	—	73	—	312	5	29	2	—	—	847	2	1,791	13	164·4	1·0
1852-53	„ 78th Highlanders	1,252	401	—	1	—	98	2	83	4	308	2	31	—	—	—	868	1	1,790	9	142·9	0·7
	„ 86th Regiment																					
1853-54	„ 78th Highlanders	1,831	1,514	3	5	1	182	2	203	6	499	4	54	1	1	—	1,249	7	3,707	24	202·4	1·3
	„ 86th Regiment																					
1854-55	„ 78th Highlanders	921	754	1	12	2	64	4	107	3	169	1	26	2	1	—	523	7	1,656	20	179·8	2·1
1855-56	„ 78th Do.	878	463	2	4	—	42	3	52	—	115	—	26	—	—	—	471	2	1,173	7	133·5	0·7
1856-57	„ 78th Do.	768	173	—	1	—	37	—	56	2	117	3	27	3	5	4	433	2	849	14	110·5	1·8
1857-58	D Troop Royal Horse Artillery 8-14 Royal Artillery H.M.'s 18th Royal Irish Regiment H.M.'s 33rd Regiment Depôt H.M.'s 78th Highlanders Depôt H.M.'s 86th Regiment	1,076	404	3	6	—	81	4	17	2	126	1	22	—	—	—	596	2	1,252	12	116·3	1·1
1858-59	D Troop Royal Horse Artillery Detachment 8-14 Royal Artillery Y. T. B. Royal Artillery H.M.'s 18th Royal Irish Regiment H.M.'s 31st Regiment „ 33rd Do. Depôt H.M.'s 78th Highlanders Depôt H.M.'s 86th Regiment German Legion	3,049	1,480	3	6	—	222	4	58	4	376	7	43	2	1	—	1,858	1	4,044	21	132·6	0·6
1859-60	1-13 Royal Artillery 8-13 Do. 7-13 Do. 11th Company Royal Engineers H.M.'s 31st Regiment „ 57th Do. German Legion	1,757	1,175	3	1	1	78	4	65	4	209	19	31	1	40	26	1,325	2	3,014	60	171·5	3·4

POONA.
BOMBAY.

EUROPEAN TROOPS—*continued.*

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	European Troops in the Indian Army.																					
1850-51	2nd Troop Horse Brigade 3rd Do. 4th Do. 1st Bombay European Regiment Fusiliers	1,386	1,440	9	3	—	97	4	106	5	261	10	126	3	14	4	1,565	2	3,612	37	260·6	2·6
1851-52	2nd Troop Horse Brigade 3rd Do. 1st Bombay European Regiment Fusiliers	1,305	612	—	5	1	104	5	110	3	210	8	139	1	1	1	1,351	4	2,532	23	194·0	1·7
1852-53	2nd Troop Horse Brigade 3rd Do. 1st Bombay European Regiment Fusiliers	1,020	704	—	—	—	125	3	79	—	170	5	196	—	—	—	1,276	4	2,550	12	250·0	1·1
1853-54	2nd Troop Horse Brigade 3rd Do. 3rd European Regiment	560	162	—	—	—	38	2	16	1	115	1	17	1	2	2	423	1	773	8	138·0	1·4
1854-55	1st Troop Horse Brigade 2nd Do. 3rd Do. 3rd European Regiment	840	651	3	3	—	161	2	40	2	411	6	12	—	7	7	939	5	2,224	25	264·7	2·9
1855-56	Horse Brigade 3rd European Regiment	1,051	830	2	2	—	72	3	45	1	448	3	34	1	—	—	1,425	1	2,856	11	271·7	1·0
1856-57	Horse Brigade 3rd European Regiment Station Staff	1,035	521	4	2	—	80	—	59	4	266	—	28	—	8	3	1,224	3	2,188	14	211·4	1·3
1857-58	Horse Brigade 1st Company 2nd Battalion Artillery 3rd Company 2nd Battalion Artillery 4th Company 2nd Battalion Artillery 3rd European Regiment Station Staff	505	226	1	—	—	51	2	36	4	177	3	15	1	—	—	912	2	1,417	13	280·5	2·5
1858-59	Horse Brigade Depôt 3rd European Regiment Station Staff	177	129	1	5	—	26	1	17	1	71	4	6	—	—	—	247	2	501	9	283·0	5·0
1859-60	Horse Brigade Station Staff	294	167	—	—	—	44	5	23	2	128	3	19	—	30	11	289	2	700	23	238·0	7·8

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	L. W. 1st Grenadier Regiment Native Infantry 3rd Regiment Native Infantry 14th Regiment Native Infantry 27th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,207	1,071	6	39	2	63	4	5	—	196	5	20	—	20	9	905	7	2,319	33	105·0	1·4
1851-52	3rd Regiment Native Infantry 27th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,228	787	3	44	1	43	5	4	—	148	2	17	—	4	2	722	8	1,769	21	79·3	0·9
1852-53	3rd Regiment Native Infantry 27th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,248	729	4	13	—	56	1	19	2	195	4	37	1	—	—	1,066	8	2,115	20	94·0	0·8
1853-54	3rd Regiment Native Infantry 4th Regiment Native Infantry 19th Regiment Native Infantry 27th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,627	979	8	26	2	65	5	12	1	198	1	27	1	69	21	1,091	5	2,462	39	93·7	1·4
1854-55	4th Regiment Native Infantry 19th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,131	1,156	4	30	1	63	2	11	1	188	2	31	—	20	8	1,032	5	2,531	23	118·7	1·0
1855-56	4th Regiment Native Infantry 6th Regiment Native Infantry 19th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	1,587	1,052	—	15	—	84	—	12	—	196	3	29	—	—	—	1,034	5	2,422	8	152·6	0·5
1856-57	4th Regiment Native Infantry 6th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	1,577	896	1	28	—	76	3	12	2	147		19	1	6	3	928	1	2,112	15	133·9	0·9

NATIVE TROOPS—*continued.*

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1857-58	5th Company 4th Battalion Artillery L. W. 3rd Regiment Light Cavalry 6th Regiment Native Infantry Depôt 25th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	2,272	889	6	51	1	62	2	13	—	158	4	21	2	—	—	1,135	6	2,329	21	102·5	0·9
1858-59	6th Regiment Native Infantry 25th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	1,857	557	3	30	—	34	3	8	1	72	4	9	1	—	—	777	6	1,487	18	80·0	0·9
1859-60	6th Regiment Native Infantry 15th Regiment Native Infantry 25th Regiment Native Infantry Staff with Sappers and Miners Detachment Poona Irregular Horse	1,807	662	2	19	—	26	1	23	1	97	1	7	—	21	7	612	5	1,467	17	81·1	0·9

WOMEN AND CHILDREN.

Years.	CORPS.	WOMEN. Strength. Europeans.	Indo-Europeans and Natives.	Total.	Treated. Europeans.	Indo-Europeans and Natives.	Died. Europeans.	Indo-Europeans and Natives.	Ratio per Cent. to Strength. Treated.	Died.	CHILDREN. Strength. Europeans.	Indo-Europeans and Natives.	Total	Treated. Europeans.	Indo-Europeans and Natives.	Died. Europeans.	Indo-Europeans and Natives.	Ratio per cent. to Strength. Treated.	Died.
1852-53	H.M.'s 78th Highlanders	80	8	88	63	11	2	—	84·1	2·2	116	9	125	72	9	3	1	64·8	3·2
	„ 86th Regiment	115	4	119	90	3	—	—	78·1	—	231	5	236	215	6	8	1	93·6	3·8
1853-54	„ 78th Highlanders	71	13	84	95	5	1	—	119·0	1·1	115	9	124	136	4	6	—	112·9	4·8
1854-55	„ 78th Do.	72	8	80	90	23	3	—	141·2	3·7	113	13	126	148	13	16	1	127·7	13·4
1855-56	„ 78th Do.	70	12	82	73	9	1	—	100·0	1·2	118	14	132	105	13	8	2	89·3	7·5
1856-57	Depôt H.M.'s 78th Highlanders	68	8	76	11	1	1	—	15·7	1·3	132	6	138	12	1	3	—	9·4	2·1
1857-58	H.M.'s 18th Royal Irish Regiment	4	—	4	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—
	H.M.'s 33rd Regiment	53	—	53	26	—	1	—	49·0	1·8	81	—	81	28	—	5	—	34·5	6·1
	Depôt H.M.'s 78th Highlanders	64	12	76	47	7	—	—	71·0	—	128	15	143	57	3	6	—	41·9	4·1
	Depôt H.M.'s 86th Regiment	78	1	79	38	—	1	—	48·1	1·2	139	7	146	30	—	1	—	20·5	0·6
1858-59	Depôt H.M.'s 78th Highlanders	60	15	75	27	5	—	1	42·6	1·3	123	19	142	42	10	4	—	36·6	2·8
	Depôt H.M.'s 86th Regiment	75	10	85	36	—	2	—	42·3	2·3	144	10	154	43	—	12	—	27·9	7·7
1859-60	6/13 Royal Artillery	13	—	13	1	—	—	—	7·7	—	12	—	12	1	—	1	—	8·3	8·3
	7/13 Do.	4	—	4	—	—	—	—	—	—	7	—	7	—	—	—	—	—	—
	Details Do.	4	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	H.M.'s 57th Regiment	45	—	45	7	—	—	—	15·5	—	57	—	57	11	—	—	—	19·3	—
1852-53	2nd Troop Horse Brigade	11	8	19	9	6	—	—	78·9	—	16	19	35	15	7	1	1	62·8	5·7
	3rd Do.	11	7	18	5	1	—	1	33·3	5·5	12	9	21	1	5	—	1	28·5	4·7
	1st Bombay European Regiment Fusiliers	28	22	50	49	40	1	2	178·0	6·0	41	20	61	44	16	6	—	98·3	9·8
1853-54	2nd Troop Horse Brigade	9	9	18	1	3	—	—	22·2	—	14	17	31	—	—	—	—	—	—
	3rd Do.	10	10	20	10	2	—	—	60·0	—	21	9	30	3	2	2	2	16·6	13·3
	3rd Bombay European Regiment	16	3	19	5	—	—	—	21·0	—	21	5	26	1	—	—	—	3·8	—
1854-55	1st Troop Horse Brigade	11	10	21	2	—	—	—	9·5	—	18	20	38	2	1	1	—	7·8	2·6
	2nd and 3rd Troop Horse Brigade	28	25	53	9	6	—	—	28·3	—	44	45	89	17	10	1	2	30·3	3·3
	3rd European Regiment	20	4	24	26	2	—	—	116·6	—	19	7	26	13	—	2	—	50·0	7·6
1855-56	Horse Brigade	26	18	44	9	3	—	—	27·2	—	48	27	75	7	5	5	2	16·0	9·3
	3rd European Regiment	39	7	46	46	3	2	—	106·5	4·3	51	7	58	24	2	2	—	44·8	3·4
1856-57	Horse Brigade	35	15	50	22	4	1	—	52·0	2·0	54	20	74	8	7	2	1	20·2	4·0
	3rd European Regiment	45	9	54	66	—	8	—	122·2	14·8	67	11	78	60	2	3	1	79·4	5·1
1857-58	Horse Brigade	30	26	56	28	—	1	—	50·0	1·7	37	45	82	22	2	5	2	29·2	8·5
	Depôt 3rd European Regiment	46	9	55	23	—	—	—	41·8	—	64	10	74	13	—	—	—	17·5	—
1858-59	Horse Brigade	38	20	58	26	6	—	—	55·1	—	50	28	78	16	2	6	2	23·0	10·2
1859-60	Do.	16	7	23	16	7	—	—	100·0	—	20	10	30	7	9	1	3	53·3	13·3

Note.—No reliable statistical information as to the diseases and mortality of native population procurable.

By order of the Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1860.

W. C. COLES, Assistant Surgeon
Secretary.

I.A.

POONA.
BOMBA

References to Subjects and Queries.	Replies.
XII. Hospitals.	1, 2. Plans of the hospitals, showing position as regards barrack buildings and the bazaar, are transmitted. The sites of the hospitals are generally open, and freely ventilated, and there are no causes interfering with the ventilation. The sites are generally healthy, and no nuisances arising from drainage, malaria, river banks, marshes, nullahs, ditches, water pits or foul ground, exist. 3. Although the supply of water in camp is generally insufficient, the supply to the hospitals is abundant and wholesome. 4. There is no regular system of artificial drainage in this camp, it not being allowed by Government regulation. All refuse water and other impurities are carried away by sweepers employed for the purpose, to such a distance from the camp as to ensure perfect immunity from noxious influences. 5. The lowest wards of the hospitals are raised an average of 3 feetabove the ground, but there is no perflation of air beneath the floors. The roof water sinks into the subsoil. There is no surface drainage or guttering round the hospital; but from the porous nature of the soil and the situations of the hospitals the rain fall is rapidly carried away. The hospitals are built of brick and mortar, or brick and mud pointed with mortar. The roofs of the two native hospitals are thatched, those of the Europeans tiled; the floors of the former are made of a light description of clay, those of the latter are flagged. The roofs and walls are single, but sufficiently thick to keep the hospitals cool. Verandahs do not exist in the European hospitals, but they do in the native hospitals, and these average 10 feet wide, and afford sufficient shelter from the sun's rays. The verandahs are not used for the accommodation of sick, convalescents or others. The hospitals consist of one flat.

TABLE OF HOSPITAL ACCOMMODATION.

Wards.	Regulation No. of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.			Remarks.
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.	
Ghorepoore.								ft. in.				
Hospital - - -	100	300	24	18	129,600	1,296	72	1 4	35	6½	3¼	Built in 1842. Two additional wards built in 1849.
Left Flank.												
Hospital - - -	107	349	24	18	138,204	1,291	72	1 4	72	5	3	Built in 1826.
Native Infantry.												
Left Flank - - -	30	96	22	18	38,016	1,267	70	1 4	13	6	3	Built in 1823.
Right Flank - - -	30	96	22	18	38,016	1,267	70	1 4	13	6	3	Built in 1828.
Horse Artillery.												
Hospital - - -	21	62½	24	18	27,000	1,286	71	1 4	14	3	5	Built in 1860; additions made in 1848.

As far as practicable 1,800 cubic feet of air are allowed for each patient.

The hospitals are so placed as to receive the full benefit of prevailing winds.

The windows open outwards, and their arrangement and construction are conducive to coolness and ventilation.

6. The means of ventilation in the hospitals are the doors, windows, and cowl ventilators; but these are scarcely sufficient for the purpose. A portion of the roof should be raised a foot above the lower portion entirely round the building. There are no jalousies or jhilmils.
7. The air, during the hot season, is cooled by passing through tatties, formed of a fibrous root (the "kus-kus,") which are kept constantly watered by coolies, and by punkahs.
8. There is no necessity for warming the air admitted to the hospitals. The walls and ceilings of the wards are cleansed and whitewashed whenever they require it.
9. The privies are the same as those in use in barracks. They are washed out frequently by the sweepers, are not placed over cesspits, but a deodorising material being supplied, when properly and effectually used they are not offensive. The medical officer is held responsible for this.
10. Tubs and basins, with an ample supply of water, are alone furnished for lavatory purposes at the hospital; but permanent lavatories with shower baths are much needed.
11. There are no bathing places here for the sick; but the general means for giving them hot water and other baths are supplied.
12. The washing and drying of the hospital linen are carried out by the commissariat department outside the limits of the cantonment.
13. The storage is amply sufficient.
14. The cots or bedsteads in the hospitals consist of iron frames, with broad cotton tape bottoms. The beds of the Europeans are made of quilting stuffed with straw, but the natives use their own bedding, which is simply a small rug or carpet. Some of the cots have a moveable head and foot piece. Warm cumble blankets and sheeting are amply supplied by Government.
15. The hospital kitchens are of the usual construction, and situated conveniently to the wards, and the means and apparatus are the same as those already described, and are sufficient. The cooking is properly done and sufficiently varied.
16. The diet tables and returns used in European hospitals are forwarded; but all those in use are to be found in the General Presidency Regulations and the medical codes of the Royal and local Armies. Native troops diet themselves both in and out of hospital.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	17. The establishments of sick attendants are according to Government Regulations, to be found on reference to the General Presidency Regulations and medical codes of the local army. The attendance is found sufficient. 18. The sanitary state of all the hospitals is good; and no epidemic disease, hospital gangrene or pyœmia have appeared in the wards. 19. I would suggest the following improvements:—Verandahs all round the hospitals; separate wards for contagious and epidemic diseases, a distinct ward for obstetric cases to be attached to the female hospitals, with residences for the matrons. Good accommodation for the hospital subordinates and the hospital sergeant is wanting, besides the deficiencies already mentioned. 20. Convalescents, unable to take walking exercise are carried out in doolies. There is sufficient ground round the hospitals for general exercise; but there are no shaded walks or seats. 21. There is some accommodation at each of the European hospitals for the sick wives and children of soldiers. The arrangements in this respect are, however, very unsatisfactory, being too small, which renders it necessarily to all, and the women and children at their quarters, a source of great inconvenience and danger. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations. 23. The powers of the medical officer as to sanitary arrangements and repairs in the hospitals are confined to recommending what is desirable, to be supported by his medical superior, and eventually carried into effect by the various departments within whose province their fulfilment rests. All subjects connected with dieting the sick, medical comforts, &c., rest with the medical officer, subject to after supervision. 24. There are no wards or hospitals for convalescents at this station, but in in this country we are of opinion that such accommodation is highly desirable.
XIII. Burial of the Dead.	1, 2. The burial ground for British troops is about three quarters of a mile from the station, and is to the leeward of the prevailing winds as regards the station. Its area is 149,000 sq. feet; it has a surface of black soil, and subsoil of moorum. Drainage is not required; and the ground is carefully kept; decomposition takes place rapidly. 3. The grave space allowed is $2\frac{1}{2}$ by $6\frac{1}{2}$ feet, with an interval between each grave of $2\frac{1}{2}$ feet, and a depth of 6 feet. The graves have not as yet been re-opened. Interment is compulsory, both at ordinary times and during epidemics, within 12 hours; and the same in native burial grounds. 4. The grave yard is sometimes a little offensive in the hot weather, but not sufficiently so to become a nuisance. British troops are buried agreeably with English customs. 5. The dead of camp followers and bazaar people are disposed of according to religious caste. Hindoos are burned; Jews and Mussulmans buried. 6. No injury accrues to the public health from the present practice. 7. No improvements, in the shape of regulations or otherwise in the burial, or disposal of the dead, are suggested.

(Signed) Frank Adams, Brigadier,
Commanding brigade and station.
Wm. Deeble, Surgeon.
56th Regiment.
W. J. Stuart, Surgeon,
25th Regiment, N. L. I.
Granville Close, Captain,
Exec. Engineer, Poona.

July 23, 1860.

KIRKEE.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is barren, but with occasional patches here and there of vegetation and groves of trees. It is dry and undulating, with hills and spurs of ghat within distances of from 2 to 14 miles. There is no wood or jungle in the vicinity. The river runs round three sides of the cantonment, in some parts bordering it; but generally from half to three-quarters of a mile from those parts used as barracks. 2. The station is elevated about 1,900 feet above the sea, but is on a level with the adjacent country. There is no higher or healthier ground adjoining the station, except the minor hills mentioned above; but none of these afford the space of table land requisite for a cavalry regiment. 3. The nearest table land is distant about half a mile, and may rise about 300 or 400 feet, and the nearest mountain is Surghur, about 2,500 feet above the station, and distant 15 miles. 4. The nearest water (except wells) is the river Moola, distant half a mile. There is no lake, marsh, nullah, or canal within 4 miles, and the vicinity of the station is not liable to overflow. There is no broken ground near the station, but there are some water pits between the lines and the bazaar, which fill in the monsoon, are a receptacle for filth, and near enough to be prejudicial to health. 5. The station is open and freely exposed to winds, and is encumbered in no way by anything so as to interfere with either free external or internal ventilation. The temperature of the station is raised by exposure of the buildings to reflected sun heat, the station being too largely scattered for such a contingency. From November to February cold land winds prevail with occasional sea breezes; from March to June there are hot, scorching, variable winds, and for the rest of the year the prevailing winds are from the sea. The cold and rainy seasons are beneficial to the health of the troops, but in the hot season fever and congestive visceral disease prevail.

KIRKEE. BOMBAY.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	6. About one half of the land in the neighbourhood of the station is cultivated, but the remainder is barren. There are no works of irrigation near the station. No rice is grown near the cantonment as the soil is unsuitable for it. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. Poona is the nearest large city, and is distant about three and a half miles from the station, but does not affect the health of the latter. The village of Kirkee is so near the cantonment that it is a nuisance. It should be removed, the owners of the houses receiving compensation. 8. The surface of the station is, generally speaking, moorum, with patches of black soil here and there, and below it trap rock. The station occupies new ground. 9. Water is usually found at a depth of about 33 feet below the surface in the dry season, and 19 feet during the rainy season. 10. The river acting as a drain, the rain-fall and water from surface springs flow readily away; but, except where the ravines carry off the rain more directly, it oozes into a pervious soil, and so drains off. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived from wells, but most of these drying up in the hot season, the supply is then drawn mainly from the river. There are no tanks. 12. The water supply of the station is obtained from 7 wells, averaging 50 feet in depth, and the river. These wells are totally insufficient; they often run short (as in the present season) and Government is then put to the expense of bringing water from the river by water carriers. The bottoms of these wells are, with one or two exceptions, actually several feet above the bed of the river. To be of any permanent service they should be sunk.

TABLE showing the Chemical Composition of the Water.

	Moola River at the City Bund.					Mota Moola River at the Jamsetjee Bund.				
	12. G.	13. H.	14. H.	15. H.		16. G.	17. H.	18. H.	19. H.	H.
Date of Collection	Oct. 1855.	Jan. 1856.	March 1856.	May 1856.	Date of Collection	Oct. 1855.	Jan. 1856.	March 1856.	May 1856.	May 1856.
Specific Gravity at 60°	1000·0	1000·4	1000·6	1000·9	Specific Gravity at 60°	1000·0	1000·4	1000·25	1000·5	1000·3
Inorganic constituents. Chloride of Sodium					Inorganic constituents. Chloride of Sodium					
„ Magnesium					„ Magnesium					
„ Lime					„ Lime					
Sulphate of Soda					Sulphate of Soda					
„ Magnesia					„ Magnesia					
„ Lime	(x)	(x)	5·95	6·90	„ Lime	(x)	2·97	2·05	2·10	1·66
Nitrate of Magnesia					Nitrate of Magnesia					
„ Lime					„ Lime					
Carbonate of Magnesia					Carbonate of Magnesia					
„ Lime					„ Lime					
Silica					Silica					
Organic matter in solution	(x)	(x)	1·61	1·69	Organic matter in solution	(x)	·59	·59	·85	·68
„ „ suspended	—	—	1·90	14·29	„ „ suspended	—	—	—	1·05	·14
Total solids	1·1	6·34	9·46	22·88	Total solids	1·2	3·56	2·64	4·00	2·48
Gaseous contents	—	—	—	—	Gaseous contents	—	—	—	—	—

The water in the wells is raised by common leather buckets, and taken away in leather skins on the backs of bheesties or bullocks. The water is soft and the quality good, but its microscopic characters are unknown. The water supply of Kirkee is quite inadequate. In the hot weather the wells run dry, and the conveyance of water from the river is an expensive and inconvenient arrangement. In the cold weather Government pays monthly 433 rupees for water carriers, and during the hot months 617 rupees. The wells and the river are at present the only sources from which water is obtained. No aqueduct exists, nor is such a thing as a pump known at Kirkee, and all the arrangements for drawing water are what they may have been some 1,000 years or more ago. The executive engineer says that a scheme was devised in 1853 by Captain Berthon, late Engineers, for bringing water from a nullah about 4 miles south-west of Kirkee, near the village of Pashan, and that his estimate for the same was 75,585 rupees; but the project was ordered not to be carried out, as it was questionable whether the station of Kirkee was to be retained. The scheme was again ordered to be taken in hand in 1857, in conjunction with the design of the new barracks, but subsequently the then executive engineer, Colonel Hart, wrote in to say that he could not possibly undertake it till an efficient assistant was afforded him; and thus the affair has remained in *statu quo* ever since. The contemplation of this scheme has invariably been the excuse from year to year for not going to the expense of deepening the wells. The committee are of opinion that a special officer should be detached to carry out Captain Berthon's scheme of bringing water from the rivulet in question, and that it will be bad economy not to set about it at once.

13. The barracks in reference to the sea breeze, are built on the wrong side of the slight slope on which the cantonment stands. This should be attended to when the new barracks are ordered to be commenced.

14. New stations, whether on hills or plains, are selected by a mixed Committee composed of the senior military authorities, executive engineer, and senior medical staff, who after making inquiry into sanitary and other questions, communicate with the civil authorities, the final decision resting with the Government. Stations have hitherto been selected in the plains.

II. CLIMATE.

1. No meteorological instruments are specially available. Kirkee presents a more favourable aspect as regards temperature, being at all seasons some degrees cooler than Poona.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. There is almost a total absence of fog, dampness is only observable in the rains, and then is mild in degree; only garden irrigation and tree planting exist, and do not produce any perceptible influence on the climate. Dust-storms are very rare, only occurring just previous to the setting in of the rains, and they do not affect perceptibly the purity of the atmosphere. The climate is favourable to Europeans. The diet here is good and varied; but the barracks are very indifferent with the exception of two new buildings. The precautions necessary to be observed are:—duties should be light, and drills take place early in the morning, and in the evening. Woollen clothing should be worn during the rains, and khakee clothes during the hot months. The most healthy months are July, August, September, December, January, and February, and the most unhealthy October, November, March, April, May, and June. During October and November, owing to the cessation of the rainy season, with elevated temperature, remittent and intermittent fevers, with visceral diseases prevail; during the hot months of March, April, and May, these, and also eruptive fevers and congestive diseases of the cerebral, thoracic, and abdominal organs, and in June, bowel complaints are frequent. Rheumatism prevails during the cold months. 4. There is no district near the station more conducive to health that would be available for cavalry. If the barracks are rebuilt, it would be desirable to select a better site in advance of the present position, where the ventilation would be much improved. 5. We have served in most of the stations of the Deccan, the Southern Mahratta country, the Mhow division, Sinde, the Concan and Guzerat. These stations in the Deccan being on an elevated table land of the trap formation, and about 1,800 feet above the level of the sea, are the most conducive to the health of troops. Next in degree are those of the Mahratta country, and Mhow division from similar causes, and next those in Sinde, although the elevation is slight; the country surrounding the station being for the most part a sandy plain, free from jungle vegetation. The stations in the Concan, or coast border of the presidency are comparatively healthy, being situated within the full influences of the sea breezes, but they are, however, subject to severe visitations of epidemic and zymotic diseases. With the exception of the Deesa station, (salubrious from being situated in an open sandy plain), the stations in Guzerat are positively injurious, the elevation above the sea being very slight, and the soil alluvial, with a rich rank vegetation, and abounding in rivers with a small degree of fall, exhibiting extensive alluvial banks.
III. Sanitary Condition of Station.	1, 2, 3. Map and plans of the station, and the surrounding country, and plans of the station are transmitted. 4. Table of Barrack accommodation. Date of construction—new barracks in 1843 and 1852. Old barracks in 1827 and 1837. Total number of rooms or huts - - - - 16 Total regulation of non-commissioned officers and men - - - { N.C. officers - - 32 ; men - - - 576

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
				Mean.	Feet.			Ft. in.		Feet.	Feet.
12 Chuppered Barracks, each -	36	97	24	16	37,248	1.034⅔	64⅔	1 4	16	5	3
2 Tiled do., each	36	97	24	18	41,904	1,164	64⅔	1 4	16	5	3
2 Do. do.	36	97	24	23	53,544	1,487⅓	64⅔	1 4	16	5	3
Guard Room -	12	40	16	14	8,960	746⅔	53⅓	1 4	4	5	3
12 Prison Cells, each - -	1	10	10	17½	1,750	1,750	100	1 4	—	—	—

5. There are no properly constructed windows, but wooden shutters, which fold back on hinges, on all four sides of each barrack. There is an open verandah along the south side of each of the old barracks, about five feet wide, and in the two new barracks an open verandah about nine feet wide on the north side. There is also an enclosed verandah of same width on the south side; except on an emergency, these verandahs are never used as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils, except in the two new barracks, which are properly made. There are 14 old, and two new barracks.
6. The majority of the bedsteads used in barracks are merely boards and trestles, but there are a few iron bedsteads, with cross thin iron straps. The bedding for each soldier consists of one numda, two cumlie blankets, and two pairs of sheets, with one cotton coverlid, all supplied by Government. The Committee are of opinion, that iron cots should be generally substituted for the boards and trestles as securing greater health and cleanliness.
7. The following Tables show the structure and dimensions of the tents used in camp:—

Tent for European soldiers, double poled, with fly and shed, and single set of walls.

Extreme length within,	22 feet - -	For 14 horse artillery.
„ breadth „	14½ „ - -	or 22 foot „
Height of walls	12¼ „ - -	or 22 infantry.
„ to ridge	12¼ „ - -	or 16 cavalry.
Total area	- -	319 square feet.
Cubic space	- -	2,393 cubic feet.

Tents for European soldiers, single pole with fly, shed, and single set of walls.

Extreme length within,	14 feet - -	For 8 horse artillery.
„ breadth „	14 „ - -	or 10 cavalry.
Height of walls	6 „ - -	or 13 foot.
„ to cap	12 „ 2 inches -	
Area -	- -	196 square feet.
Cubic space	- -	1,268 cubic „

KIRKEE. BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	Tents for native soldiers, single pole, nearly circular, with bell-shaped fly only. Diameter, 11 feet - - - } For 12 infantry. Height to cap, 10 „ - - - } Area - - - 94 square feet. Cubical space - - 180 cubic „ European hospital tent, double poled, with fly and shed, and double set of walls. Extreme length inside, 22 feet 9 inches - } For 12 Europeans, or 15 natives. „ breadth „ 16 „ 4 „ - Height of walls, 6 „ 3 „ - „ to ridge 12 „ 9 „ - This gives about 30 square feet - } Per European. And 260 cubic „ - Hospital tents for native soldiers, double pole, oval shape, with fly only. Extreme length within, 26 feet 8 inches - - } For 25 cavalry, or 30 infantry. „ breadth „ 13 „ 9 „ - - Height to ridge, 9 „ 6 „ - - Area - - - - 383 square feet. Cubic space - - - 1,030 cubic „ 8. In the old barracks, which include all except two, there can scarcely be said to be any ventilation. Each house, however (holding half a troop), has two small pigeon-house (louvre boarded) ventilators in the roof, but the construction of these is so imperfect that during the annual rains, when ventilation is most needed, they are obliged to be covered with tarpaulin by the Engineers' Department. The ventilation of the new houses is by louvre boards on the sides, and holes (of insufficient size) in the upper part of the walls of the sides, and ventilation through the roof at the top with louvre boards. The ventilation on the whole in the new houses is good. The huts and guard-rooms have no ventilation whatever, except what they receive from doors and windows. The ventilation is not sufficient to keep the air pure by night. Some arrangements should be adopted (which the soldier could not interfere with) for the free ventilation of the rooms when the doors and windows are closed. There are no means used in the barracks for cooling the air admitted. 9. The two new barracks are of burnt brick and lime; the remainder are of burnt brick and mud. The floors of the new barracks are paved; those of the old ones are of earth. The roofs of the former are tiled, and those of the latter thatched. The huts, or married men's quarters, are constructed, some of stone and mud, and some of wattle and daub, and are mostly thatched. 10. The flooring of the 14 old barracks is of mud. They can scarcely be said to be raised above the level of the ground; and such being the case, there can of course be no passage of air underneath. The floors of the two new bungalows are of stone. They are raised three feet above the ground, but there is no passage of air beneath them. 11. The materials of which the two new barracks are constructed are good; those of the other 14 decidedly the reverse. The former would be vastly improved by a continuous ventilator in the roof, as in the new upper-storied barracks at Poona. Of the remaining barracks it can only be said that they are condemned, being merely old, worn out, thatched sheds. New barracks are sanctioned, and the sooner they are begun the better, as these present old places are hardly habitable, and not suited to the climate. In fact, they are defective *in o*. In this country, barrack rooms should be elevated above the ground at least 14 feet, as such an arrangement entails, at all times, a clearer and more healthy atmosphere for the soldier, both by day and night. The lower portion of the building might be converted into dining rooms, washing rooms, libraries, skittle alleys, &c. Most of the subsidiary detached buildings would thus be done away with, and no extra expenditure entailed. We would also strongly advocate, for all new barracks, the adoption of open verandahs, as the men like them, and they add to the ventilation of the barrack rooms. Some of the lower portion of the building might be made available for saddlery, and harness for horse artillery, and cavalry respectively. The barracks and cantonment are kept in repair by the executive engineer, and the repairs are mostly executed by native contractors, and oftentimes delay is experienced in consequence of the natural dilatory disposition of the native, want of sufficient supervision, and other circumstances. No officer is responsible for the general sanitary state of the cantonment. The Committee strongly recommend that it should be the *sole* duty of a separate medical officer to attend to the sanitary state of so large a cantonment (including Poona and Kirkee). The walls and ceilings of the barracks are cleansed and limewashed at intervals of three months, and oftener, if necessary. We would recommend that in future barracks be whitewashed "Regimentally," and that lime, brushes, &c., should always be kept in store by the quarter-master. 12. The lavatories at this station are merely open, paved verandah rooms, with tubs placed in them, amply supplied with water. The waste water runs off into tubs placed outside. We would recommend that instead of these, wedge-shaped cesspools of cut stone, guaranteed against leakage, should be adopted, or, which would, perhaps, be better still, iron tubs, japanned or glazed. There are two washing-rooms generally to each barrack room. 13. The regimental cook-room here is a simple rectangular building, with an opening in the roof and walls for the escape of the smoke. The fire-places are nothing but masonry platforms, about two feet high, with iron rests, called choolas, for the cooking-pots. In all these cook-houses the ventilation is so imperfect that the escape for the smoke is insufficient. Water is provided by bheesties. The refuse water is drained into cesspools, which are cleaned out nightly by halalcores or sweepers. Large iron japanned glazed tubs would be better still. The washing and drying of linen in India are invariably done by the natives, who take the clothes away, wash them, and bring them back clean and dry, except during the rains, when the natives have no means of drying them, and necessarily bring them home wet. The Government do not provide the troops with any means of drying the linen. The captains of troops, however, provide, at their own expense, large baskets over pans of lighted charcoal, on which the clothes are placed and dried. The Committee are of opinion that captains of troops should not be put to this expense. 14. A plan of the privies, &c. is transmitted. The privies for Europeans are simple buildings, and will be easily understood by the sketch forwarded. The filth falls into baskets, and is carried away by sweepers, and the urine drains into cesspools. Pans, similar to those recommended for the cook-rooms, would be better than cesspools, and we would recommend that in lieu of the baskets the pans be adopted. The contents of the privies are

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	carried away twice a day by the natives, to a spot about half a mile distant from the barracks. When the wind sets from that quarter, the smell is sometimes complained of. A kiln in which to burn the filth is in course of construction. 15. Each barrack (holding half a troop) is lighted by four single wick oil lamps. In no case is the light given by the barrack lights sufficient for a man to read by, and those men who wish to read are obliged to purchase oil and lamps for themselves. We would recommend that similar lanterns to those used on board of Her Majesty's troop ships (swinging lamps and deck lamps) should be introduced as an experiment. 16. No arrangements for drainage exist in the barracks. All deposits, waste water, filth, &c., are removed to a specified locality by the sweepers. There is no drainage for carrying away the refuse water from the wash-houses, cook-rooms, privies, &c. In the two new barracks there are two small pits, about nine feet from the end of each building, which are cleaned daily. In the other barracks the water runs out into tubs. The urine is deposited in iron vessels, which are emptied three times a day, by sweepers, into leather bags, and these are carried away by bullocks, and emptied at a proper distance from the barracks. The buildings used as barracks and hospitals are all dry in the dry weather, which lasts nine months, but are wet and damp during the remaining three months. The primary cause of the damp is the excessive amount of moisture in the air during the wet season. Pans of lighted charcoal are placed in the rooms, for as long as may be deemed advisable, when necessary. As before mentioned, all refuse, both fluid and solid, is carried away by the sweepers. There are small cesspools, three feet by three feet by three feet; but, as above mentioned, they are daily cleaned out, and are not in the vicinity of any wells. There are no ditches near the station. 17. The surface cleansing of the cantonment is done by natives, and, so far as the defects stated above will allow, is well done. Everything solid is removed daily, or twice a day, to a spot half a mile distant, to be burnt. The manure is removed daily to a distance and sold. 18. The surface of the cantonment is kept free of vegetation. There are no old walls, and the hedges in the camp are kept cut to a certain height, so as not to interfere with the ventilation of the station. We would recommend that householders should be forced to remove these hedges, and substitute low masonry or brick walls. We are also of opinion that all hedge rows outside, but in the vicinity of the camp, and on either side of the road, leading from Poona to Kirkee, should never be allowed to exceed 3 feet in height. 19. The drainage of the bazaar in this station is less objectionable than is usually the case in most Indian bazaars, and, not being crowded, there is little fault to be found in the ventilation. The river runs within 80 yards of the base of the bazaar, so that the water supply is sufficient. The bazaar is kept clean. Latrines have been much wanted for the station. These have just been sanctioned, but an extra one is specially needed for the bazaar people. The chowdrie of the Kirkee bazaar, which belongs both to the regiment and the station, inspects it daily, to see that it is kept properly clean. The conductor also visits this bazaar four times a month. The dust is carted away to the jungle in the same way as in the Sudder bazaar in Poona, and by the same establishment. The native houses near this station are of fair average construction, and there are no dung heaps nor cesspits within them. No nuisance is experienced in barracks from wind blowing over the native houses. 20. There are no slaughter-houses at Kirkee, the meat for the soldiers being supplied from Poona. 21. The camp bazaar horses are picketed outside and to leeward of the followers lines and the bazaar, in places about half a mile distant from the station, and to leeward of the barracks. The manure is carted away by the surrounding gardeners, tile makers, &c., or taken to the jungle. It is cleared away daily. Horses for private purposes are kept in stabling in the compounds of the house owners, and the manure is disposed of as above. 22. There are no stables, except for sick and delicate horses. The horses of the regiment are picketed out in lines; but these lines are not to windward of either the mens' barracks or the hospital. The manure is removed daily by the native followers, and sold to a contractor. The horses are picketed in open columns of troops (from 30 to 40 horses in each line), distant about 80 yards from the barracks, and about double that distance from the hospital. 23. The quarters for married non-commissioned officers and men are sufficient in number, but extremely bad in construction, except a portion for the superior non-commissioned officers, for whom the accommodation is excellent. There are no married people in barrack rooms.
Officers' Quarters.	1. There are no officers' quarters at this station, but the officers rent houses built for them by speculators in the cantonment. As regards any sanitary improvements we have no suggestions to offer.
IV. Health of the Troops.	1. The station, district, and adjoining native population are healthy. 2. Spleen disease is very rare here, but at the setting in and termination of the rainy season, bowel complaints and fevers of the intermittent and remittent types prevail: during the hot season eruptive fevers, particularly variola, varicella, and rubeola, and during the wet and cold seasons catarrhal and rheumatic affections are prevalent. 3. This healthiness is attributable to the elevation and the trap formation of the surrounding country, its freedom from alluvial deposits, and the general prevalence of westerly or sea breezes, and to good water. 4. The regiment came straight from England, and landed here in October 1858; the men were healthy on disembarking. The chief diseases since have been fever and diarrhœa, and about six deaths from cholera. The married men's quarters, on the right flank, are very bad, ventilation deficient, and during the rainy season they are very damp. 5. The men at this station are not camped out. 6. We have never been in charge of troops at hill stations. The following replies are founded on the opinions of C. Moorhead, Esq., M.D., late acting superintending surgeon at Poona, and published in "Transactions of Bombay Medical Society." His experience and researches are favourable to hill stations for troops, provided a proper season is chosen for sending them; and, if sick or convalescent, a proper selection made. His experience is founded on personal knowledge, and the reports of medical officers stationed at Malcolm Pait, on the Mahableshwur hills, and at Poorundhur. 7. Dr. Morehead states, if the debilitated soldier, who in the plains would recover his health and strength slowly after the removal of positive disease, will (by commencing a residence on the hills in October, or during the hot months, having become fitted for duty) be less liable to fresh attacks of disease, and, when attacked, the disease will be of a milder type, whereas, on the other hand, the continued residence in the plains leaves him predisposed to

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	attacks of the severer forms of disease. The ultimate effect of a freer use of hill climates must be to reduce mortality and invaliding. He disapproves of sending troops during the cold or rainy months, if sick, as liable to be injured by a return of former diseases. 8. Hill stations should decidedly be selected for troops, but only as a change of climate. 9. Convalescents sent to the hills in the cold and rainy seasons are liable to recurrences of organic visceral disease. Again, if troops go to them exhausted by service in the field, they are liable to congestive, inflammatory, and organic visceral diseases, otherwise they are only subject to mild hill diarrhœa, and the general effects of a rarefied atmosphere. 10. Concerning diet, clothing, shelter, exercises, &c., no data are given in Dr. Morehead's report. The inference, however, is clear that, as there is liability to the formation and recurrence of visceral disease, cerebral excitement, and other complaints of the sthenic type, the diet should be of a non-stimulating nature, the clothing adapted to a climate much cooler than that of the plains, the shelter affording perfect protection from fogs, rain, and the direct rays of the sun; the duties and exercises depending upon the improving health of the soldier. 11. From the reports of the medical officer of the Deccan hill stations, it appears that, from the commencement of the month of March to the middle of the month of November the greatest advantage to health will be gained by the debilitated or convalescent from disease at Poorundhur; the rainy portion from June to October is inapplicable to Malcolm Pait. The healthy soldier may reside with advantage at Poorundhur and Panch Gunny at any season. As far as practicable, all ailing men should be afforded one month's residence in the hills; but the period required for complete restoration will vary in different cases, and its determination should be left to the discretion of the medical officer in charge of the sanitarium. 12. Applying the question to the hill stations of the Deccan, as affecting the health of troops returning to the table land on which the military stations are situated, or to other stations in this presidency, Dr. Morehead states that the hill climate from the middle of November to the end of February might not prove injurious; still it possesses no advantages over that of the Deccan, and that season is most suitable for return to all stations in the plains. 13. Proper selection of period, and good ambulance, are the precautions necessary for protecting the health of troops on their leaving hill stations for the plains. 14. Dr. Morehead says the question has been often raised, would a regiment fresh from England, located at an elevation of, say, 7,000 feet, retain its European vigour? Doubtless it would, a deduction being made for a rarefied atmosphere. But this regiment would not be efficient for the contingencies of service in India, and if suddenly called to the plains for service in the hot season, it would show a heavy sick list and a rapid loss of vigour and stamina would ensue. But an improved state of general health will accrue to the soldier in India from an improved sanitary system, including the avoidance in the hot season of the heat of the plains by a more extended resort to hill stations. The maintenance of the greatest degree of health and efficiency for the ordinary contingencies of service in a tropical country, is to be obtained by avoiding, as much as possible, unhealthy localities and seasons, such as localities with malarious characteristics, the hot season all over India, and the rainy season in many parts of it. These points attended to, frequent change (which is most harassing to the soldier) will be quite unnecessary, and can only be deemed even advisable when troops are located in unhealthy districts. 15. The amount of barrack and hospital accommodation provided at hill stations is totally insufficient. There are two recognized sanitaria in the Deccan, viz., Malcolm Pait, established in 1828, and the hill fort of Poorundhur in 1852. European troops have not been located at the former, but there are Government quarters for 16 sick officers, and also 77 private bungalows. Upwards of 300 visitors resort there annually, with such a favourable result to health that, with proper hospital and barrack accommodation, it might be rendered an equally favourable sanitarium for troops, except during the rains, when the fall of rain, about 240 inches, renders it uninhabitable. But at a distance of 10 miles, on the eastern slope, Panch Gunny, at about 500 feet less elevation, with a fall of only 80 inches, would render this circumstance avoidable. At Poorundhur there are two barrack rooms, affording accommodation for 100 men, a very good hospital for 40 sick, a patchery for 10 families, and a small female hospital. The sanitarium may at present be considered sufficient for 130 soldiers and 10 families. 16. An average height of 4,000 feet above the sea affords the most suitable sites for hill stations. 17. The nearest ground (higher than the station) is Poorundhur, distant about 25 miles, and with an elevation of 4,200 feet. Its means of access are very indifferent. There is much atmospheric dryness in March, April, and May, and the rain-fall during the rainy season is 72 inches, when Poorundhur is frequently enveloped in mist. Its mean temperature in the cold season is 67° 5′, in the hot season 75° 5′, in the rainy season 67° 4′, and in October 69° 6′. 18. Surfaces of the trap formation as in the Deccan generally, and also where sand with the detritus of metaphoric rocks prevail, are the most healthy for stations; but where the surface is an alluvial of the peat formation, as black soils, it is most unhealthy, as in Guzerat. 19. Soldiers should on no account proceed to India before 20 years of age, and should land there at the commencement of the cold season, viz., November. In this presidency, when landed in Bombay, troops are first located in barracks situated either in the centre of the Fort or at the end of a spit of land, "Colaba," both of which sites, and the nature of the barracks, have been repeatedly condemned as most unhealthy. The clothing, drills, and marches are according to the season, and the duties are excessively heavy for troops on arrival in such a depressing climate as that of Bombay. If they arrive early in the cold season, they should be at once drafted to their respective regiments, as soon as they have been properly equipped, or to be at once removed to the table land of the Deccan, and to remain there until the opening of the next cold season. Suitable clothing should always be provided for troops immediately on their arrival in Bombay. 20. Troops should be sent to India direct from the home depôts, so as to arrive early in the cold season. Regiments on arrival in Bombay should commence their tour of service in the Deccan table land, as far as practicable. 21. The transport of troops from Bombay to the centre of the Deccan table land is by railway, and from the Deccan to the different out-stations by bullock-train, or marches. The precautions to preserve health are, to march in the cold season; that the marches do not exceed 12 miles, and are made between 2 and 7 a.m., with a halt every fourth march for one day; a

References to Subjects and Queries.	Replies.
IV. Health of the Troops—*cont.*	careful selection of encamping grounds as regards soil, good water, and avoiding neighbourhoods of large native towns on account of probable presence of epidemic disease; good tents, not crowded, and with tarpauling floors, coffee before starting, and no grog before first meal. 22. A British soldier should not serve in India for a period exceeding 12 years, but the President is of opinion that it should be limited to 10 years. 23. The invaliding boards in this presidency are composed entirely of medical officers, and there is no conflict of opinion between them. We would suggest that these boards assemble oftener to afford a more frequent opportunity for the sick soldier being sent home. 24. Invalids proceeding home should leave India in January or February as the most favourable months, and not later than the first week of March, so as to ensure their arrival in England in June, together with a fine and favourable passage, except in cases of a special nature, when they should go overland at all seasons.
Diseases.	1. Inspection parades for the discovery of incipient diseases, at this station, take place weekly, and oftener. 2. No case of scorbutus has taken place among the troops here. 3. The proportion of cases of hepatic disease usually under treatment is 1 per cent., it is generally combined with dysentery; it is to be attributed to the effects of the climate and constitutional predisposition or intemperance. 4. Dracunculus is occasionally prevalent at this station. The origin of this disease has not been determined, and its propagation is involved in obscurity. 5. The proportion of cases of venereal disease among the European troops is 14 per cent., and among the native troops about 3·5 per cent. To diminish the liability of the soldier to these diseases I would suggest the strict examination from time to time of the prostitute class, and the removal of those diseased from the bazaars. The establishment of lock hospitals would be greatly advantageous to the health of the army. 6. The troops at this station suffer from the following diseases, viz. :— *Fevers*, intermittent, of the tertian and quotidian types, and also from remittent. *Dysentery*.—Acute, the result of chills; and sometimes attributable to habits of intemperance. *Cholera*.—The different forms of Asiatic cholera. *Small-pox* is not frequent. *Rheumatism*.—Frequent. The following is the proportion which admissions and deaths from these diseases bear to the total admissions, and deaths. Total admission from all diseases during the year 884. Admissions from fever 192; 2 deaths. Proportion of admissions of all fevers to total admissions 21·7; of deaths to admissions 1·0 per cent. Cholera, admissions 7, proportion to total admissions 0·9; deaths 3. Small-pox, none. Rheumatism, admissions to total 2·0 per cent.; deaths none. 7. The nosological character of the more frequent zymotic diseases is as follows :—Intermittent fevers, generally of the tertian type. Acute dysentery, diarrhœa, carbuncle, rheumatism, continued fevers, generally mild; gonorrhœa, syphilis, and ophthalmia. These diseases mostly occur before and after the rainy season, and sometimes during the hot months. These diseases are accompanied by an atmosphere generally oppressive, muggy, and loaded with electricity; they are also frequently preceded by thunderstorms. The European troops at this station exhibit no particular predisposition, from personal habits or condition, to these diseases. The poor natives, occupying small huts or otherwise, crowding together, and having a national objection to the admission of air and light into their dwellings, sufficient causes exist to predispose them to the above diseases, especially among the lower castes, owing to their filthy habits of living and eating. 8. The prevalence of epidemic disease among the soldiers is partly due to the following causes. On the march and in the field curiosity, and other causes, inducing both Europeans and natives to go into the towns and villages near the camp, where epidemic disease is generally prevalent, their careless exposure to the mid-day sun even when exhausted after the march, and their drinking the roadside water. In cantonments there is nothing in their duties or occupations to render them liable to this class of diseases; precautions being taken to prevent their appearance. 9. Small doses of quinine have not been given as a prophylactic, at this station, against malarial diseases. 10. Epidemic disease very rarely prevailing among the troops of this station, it is not apparent that any permanent measures are required for its prevention or mitigation.
V. Intemperance.	1. The soldiers at this station are usually very temperate. The strength of the regiment is about 580, and 3 only have been tried for habitual drunkenness; but 10 others get drunk on every available opportunity, and drink hard. 2. The proportion of admissions into hospital from diseases caused directly by intemperance is 1 in 361. No statistical records are kept in European hospitals to show the effect of total abstinence, temperance, and drunkenness on the amount of sickness, mortality, and crime at the station. Drunkenness is always punished as an offence. 3. Distilled spirits are sold at the canteens as furnished by the commissariat department; but are forbidden to the soldiers in the bazaar. The quality is good, and the quantity allowed to be drawn by each man is one dram. Spirit forms no part of the soldier's ration at the station; but it does both on the march and in the field. The quality is good, and the amount two drams each man per diem; but it is not a habit to give a man a dram before morning parade. Spirit is never given as a ration to convalescents. I am not aware of any drinks, other than intoxicating drinks, being sold at the canteen or in the bazaar. 4. If taken in moderation and diluted, spirits are not injurious to the health; but the drinking of them interferes with the efficiency and discipline of any corps. 5. It would be beneficial to abolish the sale of spirits in all bazaars, but not in canteens. 6. The use of malt liquors or wines are to a considerable degree less likely to produce visceral congestion, the fertile source of all tropical diseases, than spirituous liquors; spirits producing the same effect on the system as the elevated temperature of the tropics. 7. Coffee, tea, lemonade, soda water, &c. are much used at this station; but there are no data to enable me to say what influence they have on health, efficiency, and discipline as compared with spirits and malt liquors. 8. The spirit ration no longer exists in cantonments; but porter is given as a substitute, and with benefit to the health of the troops.

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References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	9. The prohibition of the sale of spirits in canteens in England has answered well. 10. I have no recommendations to make on these points, saving those already advanced. 11. No liquor is allowed to be sold in the bazaar to European soldiers or their wives or children, and all natives acting as soldiers' servants must drink their liquor at the shop. The kelals are responsible for the due observance of these rules. The liquor sellers must buy their supplies from the contractor, and from no other person. No spirits are allowed to be brought into the cantonment, unless covered by a pass, and no liquor is allowed to be sold, except between the hours of 6 a.m. and 8 p.m. The bazaar orders and regulations are seldom infringed, the penalties being very heavy on conviction.
VI. DIET.	1. The ration for Queen's British troops and European troops in the Indian army is the same, and is composed as follows:—1 lb. bread, 1 lb. meat, beef (mutton twice a week), 4 oz. rice, 2½ oz. of sugar, ⅝ oz. of tea, or 1¾ oz. of coffee, 1 oz. of salt, 1 lb. vegetables, according to season, but at all times ½ lb. of potatoes, 3 lbs. firewood. The soldiers have three meals per diem, and the only periodical changes are in the vegetables. A responsible inspection of the constituents of the ration is made by the orderly officer and quartermaster. 2. The daily ration is composed as above. The men have three meals a day at this station; viz., breakfast at 8 a.m., bread and tea (the men generally, however, provide themselves with meat, at their own expense, for this meal); dinner at 1 p.m., consisting of soup, meat, and vegetables; tea at 7 p.m. The stoppage per man is 3½ annas. The men have a cup of coffee and a biscuit early in the morning before going to parades, which they purchase, but it ought to form a part of their daily ration. No fruit is allowed as part of the ration. The proportion of vegetables varies according to the season, but at present the one pound is composed as follows, viz., ½ lb. potatoes, ¼ lb. cabbage, and ¼ lb. onions to each man daily. 3. The president is of opinion that a larger proportion of vegetables should be allowed in the hot season. Precautions are taken that no part of the rations is disposed of by the troops, by a non-commissioned officer being made responsible for them until they are served out to the men at the hours appointed for meals. 4. The means and apparatus for cooking available at this station are of the most simple description. Large and small copper vessels, tinned twice a month, and oftener if necessary, resting on iron stands over wood fires, and a spit for roasting. There is an oven in each cook-house, but too large to be of any use. The kitchens are not sufficiently large, and, being overcrowded by native cooks, are not so clean, light, or well ventilated as they should be, but they are amply supplied with water. The food is boiled, curried, stewed, and fried, and the cooking is good, tea and coffee included. By a regimental arrangement, the men have a cup of coffee or tea and a biscuit before a march, but the charge for this is additional to that for the regular ration. 5. Gardens are of no use in India to a cavalry soldier, as his mornings and evenings are always occupied.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The dress and accoutrements in use here in the cold season are the same as those in England. During the hot weather they consist of wicker helmets with a puggre, two khakee jackets, six pairs of white trowsers, eight calico shirts, two pairs of drawers, six pairs of socks, three flannel waistcoats, and two flannel belts. I consider the present dress as suitable to the climate; but the cloth tunic and trousers should be of a light material. When troops are on field service in the hot season, they should be supplied with cummerbunds, as a protection to the spine and stomach from sun-heat. The guard dress, from 1st October to 15th June, is khakee clothing by day; but at night black or blue trousers, with red serge tunic, occasionally changing to the cloth tunic in cold nights. From 15th June to 30th September, red serge tunic, with black or blue trousers, both by day and night, are worn. The great coat is taken on guard and worn when desirable, and the men mount with packs, but do not carry them on sentry. There are permanent guard-rooms, with sun-shades, for the sentries, large enough to walk under. We would also recommend that a quilted moveable lining be provided to button inside the khakee jacket to protect the spine and loins from the heat of the sun. The present guard dress in the hot weather is khakee, with cloth overalls at night, and wicker helmets during the rest of the year. The men are protected suitably on guard from sun and wet.
Duties.	1. As regards health, it would be advisable that the men should be thoroughly drilled at home before being sent to India. 2. There is generally a mounted drill of about an hour and a half duration about four mornings in the week; after that "stables" for about three-quarters of an hour; and a foot drill in the afternoon twice a week, about three-quarters of an hour in duration. The men do not suffer from drill or work, only from *ennui*. The best hours for drills, parades, and marches are—drills in the cold weather from daybreak till 8 a.m., in the hot weather till 7 a.m., and marches so as to arrive on the camping ground by sunrise. Orders are occasionally issued on these points in the hot weather. The average number of nights the men here have in bed during the week is six. 3. The furthest guard from the barracks is the bazaar guard, about one mile distant. All regular guards last 24 hours. There is a roll-call at 11.30 a.m., at reveille in the morning at 5.30, and names are called over in the barracks. In this part of India the nights are quite healthy, and exposure to the night air has no injurious effect on health.
VIII. INSTRUCTION AND RECREATION.	1. The following are the means of instruction and recreation available at this station:—North and South Ball Courts, schools with good schoolmasters, and a library and reading-room, by subscription among the men. None is provided by Government; but a grant of 200 old volumes was made in its aid by Government. The following do not exist here for the men, but are much required by dragoons, viz., day room, soldiers' clubs, soldiers' gardens, workshops (except for the ordinary regimental tradesmen). There is no theatre, no skittle ground, no gymnasia. If these were supplied, the means would be sufficient to keep the soldier occupied during the wet season and heat of the day. A dragoon has so much to do, morning and evening, that he is comparatively little inclined to knocking about during the day. Every endeavour, however, as far as persuasion and personal influence can effect, is used to prevent the men exposing themselves to sun and rain. A room should be set apart for a theatre; a reading-room separate from the school-room, as it is found inconvenient to have them combined. If the fives court were covered in, it

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	would afford amusement during the day, and also be suitable for rackets. A skittle ground is highly desirable; a workshop for men to follow their trades is absolutely necessary. Every facility should be afforded to the industrious soldier to follow his trade. At present they have no means for such employment, and of assisting their comrades. Gardens would prove advantageous as a recreation. 2. In addition to the means mentioned above, we would recommend the adoption of a room well supplied with foils, single-sticks, masks, &c., which would be conducive to the men's health, amusement, and efficiency, as dragoons. 3. Savings' banks are instituted, and are found advantageous. 4. There is not sufficient shade afforded by trees, verandahs, &c., to enable the men to take exercise without injury to health.
IX. Military Prisons.	1. There are no military prisons, but we would strongly suggest the adoption of one at this station for the troops of this division. The cells are sufficient in number, but are deficient in arrangements and detail. If they are retained, a house is required for a provost-serjeant, with a wall and railing to encircle them; also a guard-room at the entrance, a shed for exercise and drill, and a cook-house. Privies are absolutely needed.
X. Field Service.	1. There are no local regulations for field medical service, not included in the General Presidency Regulations. 2. According to the existing regulations in the local army, medical officers can only make recommendations, and it rests with the military authorities to carry them out, the medical officer having no authority *per se*. By the new medical code of the Royal army these duties are much better defined. 3. The selection of camping grounds, and the sanitary arrangements, cleanliness, &c. of the camp, rests with the Quartermaster-General's department. Instruction and rules as to the choice of proper sites, water, soils, &c., should be published as a means of guidance. Water is supplied to the men by puckul bheesties, and to the hospital by a permanent establishment, according to strength. 4. Regulations as to field hospitals, ambulances, transport of sick, &c., will be found by a reference to the General Presidency Regulations, and the Medical Codes of the royal and local armies, in the office of the Secretary of State for India.
XI. Statistics of Sickness and Mortality.	The following Tables give the information under this head.

Kirkee.—European Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per cent. to Strength. Treated.	Ratio per cent. to Strength. Died.
	Queen's Troops.																					
1850–51	H.M. 10th Hussars	680	286	2	—	—	128	3	72	1	309	17	9	1	—	—	755	1	1,559	25	229·2	3·6
1851–52	Do. do.	702	436	6	—	—	103	3	35	—	300	4	3	1	—	—	657	1	1,534	15	218·5	2·1
1852–53	Do. do.	705	664	1	3	—	68	1	33	—	254	1	3	—	—	—	668	1	1,693	4	240·1	0.5
1853–54	Do. do.	691	681	4	—	—	57	—	19	—	195	—	6	—	10	7	630	—	1,593	11	231·3	1·5
1854–55	Do. do.	662	395	1	1	—	31	1	24	2	165	4	9	1	—	—	422	2	1,047	11	158·1	1·6
1855–56	Do. 14th Light Dragoons	720	275	2	1	—	23	1	33	—	64	1	17	—	6	1	606	1	1,025	6	142·3	0·8
1856–57	Do. do.	686	137	1	1	—	16	1	25	—	60	1	24	1	1	—	429	—	693	4	101·0	0·6
1857–58	Do. 3rd Dragoon Guards Do. 14th Light Dragoons Do. 17th Lancers	967	120	—	1	—	66	—	27	3	71	—	6	—	—	—	353	—	644	3	66·5	0·3
1858–59	Do. 3rd Dragoon Guards Do. 6th do. Depot do. 14th Light Dragoons Do. 17th Lancers	1,014	533	5	3	—	86	—	24	1	216	5	155	2	—	—	750	2	1,767	15	174·2	1·4
1859–60	Do. 6th Dragoon Guards Do. 14th Light Dragoons	1,199	392	1	3	—	123	3	47	2	289	7	51	1	7	3	880	1	1,792	18	149·4	1·5

Women and Children.

Years.	Corps.	Women. Strength. Europeans.	Women. Strength. Indo-Europeans and Natives.	Women. Strength. Total.	Women. Treated. Europeans.	Women. Treated. Indo-Europeans and Natives.	Women. Died. Europeans.	Women. Died. Indo-Europeans and Natives.	Women. Ratio per cent. to Strength. Treated.	Women. Ratio per cent. to Strength. Died.	Children. Strength. Europeans.	Children. Strength. Indo-Europeans and Natives.	Children. Strength. Total.	Children. Treated. Europeans.	Children. Treated. Indo-Europeans and Natives.	Children. Died. Europeans.	Children. Died. Indo-Europeans and Natives.	Children. Ratio per cent. to Strength. Treated.	Children. Ratio per cent. to Strength. Died.
1852–53	Her Majesty's 10th Hussars	70	2	72	127	—	3	—	176·3	2·7	114	5	119	112	7	12	1	100·0	10·9
1853–54	Do. do.	64	3	67	92	2	1	—	140·2	1·4	108	6	114	61	7	2	—	59·6	
1855–56	Do. 14th Light Dragoons	48	18	66	19	6	—	—	37·8	—	82	25	107	26	6	1	—	29·9	0·9
1857–58	Do. 3rd Dragoon Guards	3	—	3	—	—	—	—	—	—	2	—	2	—	—	—	—	—	—
	Do. 14th Light Dragoons	52	11	63	—	—	—	—	—	—	97	21	118	1	—	—	—	0·9	—
1859–60	Do. 6th Dragoon Guards	10	1	11	—	—	—	—	—	—	15	4	19	—	—	—	—	—	—

By order of the Principal Inspector-General, Medical Department,
W. C. Coles, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1861.

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References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1, 2. A plan of the hospital is transmitted. The site is good, freely ventilated, and healthy; indeed, the most healthy in the neighbourhood. 3. Bheesties supply the hospital with water in sufficient quantities, as it may be needed. 4. There is no regular system of drainage in the camp, it not being allowed by the Government regulation; but all refuse water and other impurities are carried away by sweepers to such a distance from camp as to ensure perfect impunity from noxious influences. 5. The floors of the lowest wards are raised three feet above the ground, but there is no perflation of air underneath. The roof water sinks into the subsoil. There is no surface drainage or guttering, but from the porous nature of the soil, and the situation of the hospital, the rain fall is rapidly carried away. The hospital is built of brick and lime; the roof is double-tiled, with teak trusses; the walls are single, and the floor paved. The roofs and walls are sufficiently thick to keep the hospital cool. There are verandahs to the inside of the hospital, but they are also required on the east and west outer sides. They answer well as protection from the sun's rays, and are not used for the accommodation of sick, convalescents, and others. The hospital is on one flat.

TABLE of HOSPITAL ACCOMMODATION.

Date of construction	1830
Two additional wards added in	1850
Total number of wards	6
Total regulation number of beds	100

Wards. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
6	2 small Wards capable of containing 10 sick each. 2 middle Wards capable of containing 12 each. 2 Wing Wards for 28 sick each. 100 Beds - -	360	24	Mean. 16½	142,560	1,425	86⅔	Ft. in. 1 4	46	7	5

The hospital is placed so as to receive the full benefit of the prevailing winds. The windows open into the wards, and are conducive to ventilation.

6. The ventilation is effected by doors, windows, and cowl ventilators in the roof; but they are scarcely sufficient. A portion of the roof should be raised a foot above the lower part entirely round the building. There are no jalousies or jhilmils.
7. The air admitted to the wards is cooled by kuskus chicks to the windows, saturated with water during the hot season. Punkahs are also required.
8. There is no necessity to warm the air, but stoves in the monsoon might be advantageous. The walls and ceilings of the hospital wards are cleansed and lime-washed every three months, and oftener if necessary.
9. The privies are washed out frequently by the sweepers, and, a deodorizing material being used, are not offensive.
10. Tubs and basins, with an ample supply of water, are alone supplied in the hospital, and permanent lavatories, with shower-baths, are much needed.
11. There are no permanent bathing places for the sick, and are much required; hot and other baths in general use are supplied to them.
12. The Commissariat department wash and dry the hospital linen. Means for drying are much wanted.
13. The storage is sufficient and dry.
14. Iron cots are used in hospital, with a straw mattress. Cocoa-nut shreds ought to be used in place of straw; it would be much cooler and more comfortable, and could be well washed after ordinary cases.
15. The hospital kitchen is at one end of the enclosure. Brass and copper utensils are used in cooking, and these are tinned every month. Diets are properly cooked and varied.
16. The diet tables and returns used in the European hospitals are forwarded.
17. The establishment for attendance on the sick is composed as follows, viz., hospital serjeant, ditto steward, apothecary, 2nd ditto, dresser, compounder, apprentices, and ward boys. These are sufficient.
18. The sanitary condition of the hospital is good. No epidemic disease, hospital gangrene, or pyæmia have appeared in the wards.
19. I would suggest the following improvements for the hospital at this station; verandahs round the outside, distinct ward for obstetric cases to be attached to the female hospital with better accommodation for the matron and ward boys, and on account of Kirkee being such a long way from Poona, a small native hospital is much required at the station.
20. Convalescents unable to take walking exercise are carried out in doolies. There is sufficient ground round the hospital, but no shaded walks or seats.
21. There is a female hospital for soldiers' sick wives and children, with an European nurse and native assistant; but the accommodation is too small, which renders it often necessary for the medical officer to attend the women and children in their own quarters.
22. There are no special local hospital regulations not included in the general Presidency Medical Regulations.
23. The medical officer has sufficient power in all matters appertaining to the sanitary state of his hospital, repairs in buildings, change of diet, &c., &c., but in consequence of the crippled state of Indian finances, many recommendations, acknowledged to be desirable, cannot be immediately carried out, on the constant plea of want of funds.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	24. There is no convalescent ward here, but such accommodation would be desirable.
VIII. Burial of the Dead.	1, 2. The burial ground for British troops is rather more than a mile from the station and to leeward of the cantonment. Its area is 8,500 square yards; its soil black soil, and its subsoil moorum. There is no artificial drainage, but the river acts as a drain to it. The ground is hardly so well kept as it might be. 3. The grave space allowed is 7 feet by 3½ feet, and the interval between the graves is never less than 2 feet; the depth is 6 feet. Graves have never been reopened. Interment is compulsory at ordinary times within 12 hours, and during epidemics from six to 12 hours. 4. The grave yard is never offensive. British troops are buried agreeably to the orders of the home army. 5. The dead of camp followers and bazaar people are disposed of as follows, viz., Parsees are removed to towers of silence near Poona, Hindoos are burnt, and Jews and Musselmans are buried according to religious caste. A native Christian burial ground is much needed. 6, 7. No injury accrues to the public health from the present practice, nor have we any improvements to suggest in the way of regulation or otherwise in the burial or disposal of the dead.

(Signed) C. Cameron Shute, Colonel 6th Dragoons,
Commanding Poona Brigade and Station.
Wm. Deeble, Surgeon,
56th Regiment.
W. J. Stuart, Surgeon,
H.M. 25th Regiment Native Light Infantry.

Poona, 5th September 1860.

NUSSEERABAD.

Accommodation
- Queen's Troops
  - Artillery - - 124
  - Cavalry - - 609
  - Infantry - - 914
- Native Troops
  - Artillery - - 178
  - Cavalry - - 208
  - Infantry - - 700

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is a large sandy plain, dotted with cultivation, dwarf trees, and numerous tanks. It is flat and dry, with a range of hills about six miles to the north-west. There is very little wood or jungle in the vicinity. 2. The elevation of the station above the sea is about 1,500 feet. It is from 50 to 60 feet above the adjacent country, and from 40 to 50 feet above the nearest water. There is no adjoining higher ground suitable for a military station. 3. There is a range of hills running north-east and south-west, about six miles from the station, from 300 to 400 feet high. 4. The nearest water is a large tank called "Bhotaya Khera," distant half a mile. There are two other large tanks close to the southern boundary of the cantonment. These tanks are liable to overflow during the rainy season, but cease almost immediately after the termination of the monsoon, the water being drawn off for the purposes of irrigation. The two latter tanks become dry in the cold season, and their beds are cultivated. There are some ravines, but they are the natural watercourses, leading into the different tanks. 5. The station is openly situated, its elevation is higher than the adjacent country, and it is freely exposed to winds. The temperature of the station is not raised to any considerable extent by the buildings being exposed to reflected sun heat. During the hot season, which prevails from the middle of March to the middle of July, the prevailing winds are from the south and south-west. These are scorching, and in order to keep the barracks cool kus-kus tatties are used. During the monsoon the winds are variable and pleasant. In the cold season, from November to March, the winds are from the north and north-east. The troops are healthiest in the hot season and gain strength in the cold. 6. The surrounding country beyond the limits of the cantonment is cultivated. There are no public works of irrigation; artificial irrigation, however, has no bad effect on health. No cultivation is permitted within camp limits, but a very inconsiderable quantity of rice is grown near the Bhotya Khera tank. Indigo and hemp are grown in different parts of the province, but not in the immediate vicinity of the camp. No injury or nuisance is sustained from it. 7. Ajmere, about 15 miles distant, is the only large town near the station, but there are a number of villages at various distances from it. The station bazaar itself has a very large population, amounting to upwards of 15,000. 8. The geological structure of the district belongs chiefly to the metamorphic group of rocks. The sub-stratum consists for the most part of transition gneiss, reached at a depth of a few inches in many places, while here and there the bare rock appears. In some situations the soil is many feet in thickness; it is formed of disintegrated rock, chiefly decomposed felspar (one of its constituents), producing a clay of considerable fertility and moisture. The ground appears never to have been pre-occupied by population. 9. During the dry season water is found from 10 to 50 or 60 feet below the surface, according to situation, and as a general rule at the same depth in the rainy season.

NUSSEERABAD. BOMBAY.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	10. There are no surface springs, and the cantonment being situated high the rain-fall flows readily off. The drainage is from and not into the cantonment, and what little is not carried off by natural and constructed outlets sinks rapidly into the ground. No drainage from higher ground passes into the subsoil of the station.
	11. The water supply of the station is derived from wells and tanks. The extent of tank surface within the station is 46,309 square yards, and within half a mile of it 2,899,125 square yards. The tanks fill during the rainy season, and have a fresh supply from rain-falls during the end of December or beginning of January. They nearly all run dry towards the end of the hot season; and if the commencement of the monsoon is delayed, as has been the case this year, great inconvenience, and even misery, is felt by the inhabitants of the bazaar. The European troops at the station are supplied with drinking water principally from a well at a village a mile and a quarter from the barracks during the hot season. Bathing is not allowed in tanks reserved for drinking purposes. The tanks and wells are generally free from causes likely to pollute them. With regard to whether the tanks within or without the station produce malaria, there is but very little of malarial disease within the station, particularly if the cold season quickly follows the cessation of the rains.
	12. The amount of water supply for the station is upwards of 21,000,000 of gallons, exclusive of the supply in the tanks without the cantonment limits, and upwards of 4,000,000 of gallons are supplied from wells in which there are springs. The tanks contain rain water, and its use is not injurious to health. There are eight good wells in camp, and one at the village of Dilwarra, about two miles from the centre of camp, which has a most abundant spring, and it is from here that the principal supply of water for Europeans is obtained. In the other wells the water can scarcely be denominated spring water in the strict acceptation of the term, inasmuch as in many instances it contains such a large proportion of salts as to be unfit for domestic use, and might be classed under the head of mineral water. Where the wells are tolerably deep and regularly worked, the water is generally clear and free from smell, but hard and more or less of a brackish taste derived from the salts, but the flavour varies according to the quantity of salts contained, which is seldom constant, even in the same well; at one time the water from a particular well may be palatable, and at another so loaded with saline ingredients as to be useless. A quantity of water was taken on several occasions from a well in the cantonment, used and pronounced wholesome by the natives, and carefully evaporated to dryness, when saline matter, together with some vegeto-animal impurity, was found in the very large proportion of 1 in 200. The salts consist principally of chloride of sodium and probably other chlorides, with various sulphates, chiefly those of alumina and potassa. The water is raised from wells, by means of ropes and buckets, by bheesties, who fill their mussacks, and distribute it as required. It is also conveyed in water carts, and in larger mussacks carried by bullocks.
	13. No reply to this query.
	14. New stations are usually selected by committees assembled by order of the Commander-in-Chief. A medical officer, usually the superintending surgeon of the division, is one of the members.
II. CLIMATE.	1. A thermometer and rain-gauge are the only available means for conducting and registering meteorological observations.
	2. Table of meteorological observations from August 1859 to July 1860 inclusive.

Months.	Mean Temperature.	Mean Maximum.	Mean Minimum.
1859.			
August	77·5	89·0	77·0
September*	81·0	86·0	76·0
October	79·0	84·0	78·0
November	75·0	84·0	66·0
December	64·0	69·0	59·0
1860.			
January	63·0	65·0	61·0
February	67·5	76·0	59·0
March	76·5	80·0	73·0
April	87·0	91·0	83·0
May	89·5	95·0	84·0
June	93·5	99·0	88·0
July	87·5	91·0	84·0

* During the present month up to the 7th September (1860) the range of the thermometer has been excessively high; the lowest range being 84°, and the highest 94° Fahrenheit.

3. During the hot and cold season the climate is dry; during the monsoon it is moist. The cold season commences in November and lasts till the middle of March; from that to the middle of July is the hot weather. The rains generally cease about the 15th September, during the remainder of which month and October the weather is warm and oppressive. Fogs are rare, and when they do occur it is generally towards the close of the monsoon. Dust storms are very frequent during the hot season and last for hours and sometimes during the whole day and night; they have the effect of cooling the air. The heat during May, June, and July is very great, ranging as high as 102° or 103° Fahrenheit in houses and barracks that are not artificially cooled. The monsoon season is more temperate and less subject to variation, the thermometer ranging from 78° to 86°. During the cold months the cold is very sensibly felt and warm clothing is worn throughout the day. Europeans may be all day in the open air without sustaining any injury from sun. The diet issued to the soldiers in India is of the best quality and can scarcely be improved. The shelter should be large, roomy, and well-

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	ventilated barracks. Light khakee clothing should be worn in the hot months, and the usual warm clothing during the monsoon and cold weather. In the cold season the troops may drill and exercise every day, if necessary, and almost at any time of the day, but during the months of March and April they should exercise early in the morning, so as to be dismissed drill by 7 a.m. Evening drill should not commence before half-past 5 p.m. and not last more than one hour. In May, June, and July there should be as little parading as possible, but during the monsoon the troops may parade as weather permits. The most healthy months are from January to August inclusive. The remainder are the unhealthy months, during which fevers, dysentery, and diarrhœa prevail. 4. The want of good drinking water is the great fault at this station; but taking all things into consideration, there is no district or situation near the station better suited for a military cantonment. 5. Lieutenant-Colonel Holmes has served at Bombay, Poona, Surat, Baroda, Rajcote, Sukkur, and Hyderabad (in Sinde), Kurrachee, Nusseerabad, and short periods at Deesa and Sattara, and is of opinion that Poona, Deesa, and Nusseerabad are the healthiest stations. Sukkur and Hyderabad are decidedly unhealthy. Surgeon-Major Durham has served at Bombay, Shikarpore, and Sukkur in Sinde, Ahmedabad, Kaira, Ahmednuggur, Neemuch, and Nusseerabad, and considers Nuggur and Nusseerabad both healthy stations. Kaira is an unhealthy place. Captain Griffith has had no experience with troops, having been in civil employ nearly the whole portion of his service.
III. Sanitary Condition of Station.	1, 2, 3. A map of the station, with plan of the station and ground plan of the barracks, are forwarded. 4. Table of barrack accommodation. Date of construction of barrack, March 1860. Total number of rooms or huts, 9. Total regulation number of non-commissioned officers and men, 786.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Ft.	Ft.	Ft.	Ft.			In.		Ft.	Ft.
9 main rooms - - -	80	200	20	16	64,000	1,000	50	14	24	5	4
Gable of do. - - -		200	20	$\frac{8}{2}$	16,000						
					80,000						
4 corner rooms (each) - -	2	$18\frac{1}{2}$	10	11	2,035	1,017·5	92·5	—	2	$4\frac{1}{2}$	4
4 do. do. small (each) -	2	10	10	11	1,100	550	50	—	1	$4\frac{1}{2}$	4
Guard room - - - - -	- -	50	16	14·5	11,600	—	—	—	3	4	5
Gable portion - - - -	- -	50	16	$\frac{5·25}{2}$	2,100	—	—	—			
					13,700						
Prison cells of quarter guard (each)	- -	16	7·5	10·25	1,230	—	—	—	1	4	3
									1	5	$3\frac{1}{2}$

5. Doors and windows on all sides. The shutters open upwards into the verandah, and are made of canvass, painted and stretched on frame work. There are verandahs on both sides 159 feet long by 10 feet broad. When barrack accommodation is completed it is not intended that the verandahs should be used as sleeping quarters. Heretofore they have been occasionally used when barracks are under repair or new ones in the course of construction. There are no properly constructed jalousies or jhilmils.

6. The bedsteads are wooden charpoys, laced with either cotton tape or cord; some are of iron, and others of boards and trestles. The beddings are cotton mattresses about three-quarters of an inch in thickness. Each man has three cotton sheets, two blankets (country manufacture), and one cotton rug. This bedding is not adapted to the climate of Nusseerabad during the monsoon, the cotton mattress getting very damp during the rains and the blankets not being sufficiently warm during the cold season. The bedsteads, with the exception of those of iron, harbour bugs, and it would be better that iron bedsteads should be generally used. It is difficult to suggest an improvement in the description of mattresses, for if made of any other material than cotton it would be difficult to convey them on a line of march, unless the stuffing of the mattress were of straw, in which case it could be thrown away.

7. The tents used are of three kinds,—1. European soldiers' double-poled two-walled tent 2. European hospital tent; and 3. European soldiers' single-poled tent.

No. 1 are as follows :—

Inner dimensions, $22\frac{1}{2} \times 14 \times 13\frac{1}{2}$. Kanauts (or walls) 6 ft. high } to hold 22 men, 100 cubic feet per
Outer do. $27\frac{1}{2} \times 19\frac{2}{3} \times 15\frac{3}{4}$ do. do. } man, and $15\frac{1}{2}$ square feet per do.
4 doors - - $5\frac{3}{4} \times 4$.

No. 2.

Inner dimensions, $22 \times 14 \times 12\frac{1}{2}$ do. do. } to hold 20 men, 130 cubic feet per
Outer do. $27\frac{1}{2} \times 19\frac{1}{2} \times 15$ do. do. } man, $15\frac{1}{3}$ square feet per do.
4 doors - - $5\frac{5}{4} \times 4\frac{1}{2}$.

NUSSEERABAD. BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	No. 3. Dimensions - 13,5 × 13,5 × 12,5. Kanauts (or walls) 6 ft. high { to hold 13 men, 100 cubic feet per man, 14 square feet per do. 2 doors - 5¾ × 3·5.

8. The barracks are ventilated by means of doors and windows. Of the former there are 16 and of the latter 44 in each; and in addition, there are small apertures in the wall on a level with the floors between each window, and a similar aperture 5 feet above each window. The ventilation is sufficient to keep the air pure by night and day, but it is open to the objection of too many draughts during the monsoon and cold weather. The means for cooling the air in barracks and other quarters are by punkahs and kus-kus tatties. The former is used only in the married men's quarters. It consists of an iron rod about ¾ of an inch in diameter and 6 ft. 6 in. long. To this three iron rings are attached for its suspension, and beneath hangs a fringe of coarse cloth about the same length, 9 inches in depth, weighted with leaden grains about the size of shot, procured from the Ajmere mines. The tatties are made of a framing of whole and split bamboo fastened with string made of a kind of grass. The kus-kus is brought in from the neighbouring villages.

9. The new temporary barracks are constructed as follows:—The foundations and plinth and main walls of stone and lime plastered outside; the interior and partition walls of sun-dried brick plastered with mud, and colour-washed; the roofs are of thatch, supported on date post trusses.

10. The floors are of three kinds, all solid, viz., flagstone, chunam, and moorum, but the former are mostly in use. The ground is first filled in with earth to within 6 inches of the plinth level, which is generally not less than 1 ft. 6 in. above the ground, and frequently as much as 2 feet, and even 2 ft. 6 in. The earth is well rammed, and over it a layer of stone and lime about 4 inches in depth is laid. On this rest the flagstones (dimensions 1 ft. 6 in. by 1 ft., and 2 in. thick), the joints of which are set in chunam. Chunam floors are constructed thus:—Over the layer of earth, which is usually from 9 inches to 12 inches above the ground surface, a bed of dry stone chips 4 inches in depth is laid; on this, again, is a kind of concrete of large and small limestones, mixed with sand, and well pounded together; and on top of all is a layer of plaster 1 in. or 1½ in. thick, of fine lime, which, being well beaten and rubbed to a smooth surface, forms the floor.

11. The barracks being temporary, situated on high ground, the floors tolerably well elevated and well ventilated, besides being roomy, the materials may be said to answer very well. It must be borne in mind that this was not a station for European troops previous to the mutiny, with the exception of a company of European artillery. Her Majesty's 83rd Regiment was the first European infantry that occupied the station, and it was necessary to run up barrack accommodation for them as quickly as possible. On the operations against the rebels being completed, the head-quarters and three squadrons of Her Majesty's 8th Hussars were quartered here. For these also barrack accommodation had to be constructed with all expedition. The country is very deficient in good timber for building purposes, and time did not permit of its being procured from a distance; the consequence is, that the wood work is not what would be ordinarily used. Annual ordinary and extraordinary repairs of barracks and cantonments are executed by the executive engineer, and petty repairs by the barrack department. They are quickly executed. The sanitary state is superintended by the quartermaster-general's department. The walls and ceilings of barracks are always cleansed and whitewashed once a year, and oftener on special requisitions.

12. Each of the men's wash-houses is 18 ft. by 9 ft. by 8 ft. The foundation plinth and superstructure is of stone and mud plastered inside and out with lime, and the roof is of babul wood rafters and bamboo battens, with single date mat and single tiles. They have ridges, hips, and eaves, and flagstone floors set in chunam. The walls are colour-washed a blueish grey; they have one door 6 ft. 6 in. by 3 ft. 6 in., and two fixed Venetian windows 4 ft. by 1 ft. 6 in. The cost of one wash-house is about 260 rupees. Tubs are supplied to each building, and the water is brought daily by the water-carriers.

13. The interior of the old cook-rooms is divided by a centre wall into two compartments, giving accommodation for two barracks; the whole building being of stone plastered with chunam. The roof is of slab stone, and egress for smoke is provided by small apertures in the roof, and also by semicircular openings (four on each side). There are two doorways and four windows. The number of cooking places is 36. There is a fixed establishment of washermen for the European troops and for hospitals; they wash the linen, and dry it on lines fastened to poles, which, with ironing, is all that is required in this country.

14. The contents of privies are removed twice a day by sweepers. The urinals are sluiced with water, and drained into absorbing covered cesspools.

15. These buildings are ventilated by doors and circular apertures in the walls.

16. There are no constructed drains and sewers for the barracks; any water that lodges near there is carried off by surface drainage. Being situated on the highest point of the cantonment, all surface water quickly runs off, or readily permeates. During the monsoon there is always more or less dampness; but for nine months in the year the barracks and hospitals are perfectly dry. The system of drainage that obtains in England is not required in this country, the water being carried off as above described. Each wash-house, cook-house, and urinal is furnished with its own cesspit, the contents of which are removed when requisite. The distance of the hospital cesspool is 125 yards from the nearest men's quarters; but there is a latrine belonging to the quarters themselves which is not 20 yards distant from them. The cesspool is distant 97 feet from the hospital. There are no foul ditches, but there are several natural watercourses, and some constructed ones, which conduct the water to the different tanks.

17. The surface cleansing of the cantonment is performed by sweepers every morning; they collect all rubbish and filth, part of which they carry off in their baskets, and the remainder is carted away. The manure is eagerly bought by villagers and people who keep cattle, who convey it away.

18. The surface of the cantonment is kept free from vegetation. There are no old walls, thick hedges, &c., interfering with the ventilation of the station. The ventilation is very good.

19. The main and cross streets of the bazaar have covered drains on both sides, the whole of

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	which empty themselves into the nullah on the west of the bazaar. There are a few wells used for bathing which require drains; they are in the course of construction. The ventilation on the windward side of the bazaar is good, but towards the east the bazaar is much crowded, especially where the coolies and lower classes reside. There are 25 latrines, kept clean by the sweepers to whom they belong, and who are responsible for their cleanliness; they are constantly inspected by the police. There is at present only one scavenger's cart allowed by Government; it was, however, suggested by a committee that assembled in June last that 5 carts and 5 sweepers should be sanctioned. The drinking water is supplied principally from two tanks north and south of the bazaar. There are 30 wells in the bazaar and its vicinity, but only 6 contain drinkable water, which, with the tanks, generally yield a sufficient supply, except in extraordinary dry seasons, when no drinking water is procurable within a mile of it. Each individual is held responsible for the cleanliness of his premises and the portion of street in the front of his house; and each house has a basket into which the sweepings are gathered morning and evening, to be taken away when the sweeper or scavenger's cart comes round. The crowded part of the bazaar will eventually be opened out as its population decreases, which will be when the public buildings now under construction are completed, and there will be no further employment for them. There are no native houses within half a mile of cantonment limits, which are very extensive. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Two slaughter-yards, where sheep and goats are killed, are within the present bazaar limits; and another for slaughtering bullocks just without and in rear of bazaar: they were all originally outside. The butchers are in both places held responsible for the cleanliness of the yards, and sweepers are kept by them to convey the offal as the animals are killed to a place appointed about three-quarters of a mile to the south-east of camp; from which direction the wind very seldom blows. It is contemplated to remove the slaughter-yards 250 yards in rear of the bazaar, the ground for which has already been marked out. 21. There are not more than 10 or 12 horses belonging to residents in the bazaar, and these are kept in private stables. The camp followers' and grass-cutters' ponies belonging to cavalry regiments, &c. are picketed outside their lines, and the picketing grounds are kept clear under regimental arrangement; the manure is daily taken away by the milk-men, potters, and villagers. 22. There are no stables for cavalry or artillery horses. No dung-hills are allowed to collect, the manure being sold and carried away, as before stated. The 8th Hussar horses are picketed to the rear of the barracks, and the line of pickets run perpendicular to the front of the barracks at a distance of 90 yards. The native cavalry horses are picketed in front of their lines; the line of pickets running perpendicular to the front and separated by a broad roadway from the lines. The native battery horses are picketed in the same line as the horses of the native cavalry; the lines of the company are situated on the right flank of the horses. The European infantry barracks are situate between the lines of the native cavalry and the native battery. The pickets of the 3rd Troop Horse Artillery run in front of the barracks and parallel to it. Horses are picketed in line,—a troop occupying a double line—horses facing each other. There is a low wall running in front of the horses to protect the fodder. Along the rear of the line a drain is cut, and the ground on which the horses stand is raised and slopes from the wall in front to the drain in rear; there is a space of 9 feet between each horse, and the breadth of the street is 6 yards. Each horse is picketed by one head and one heel rope. 23. The accommodation for married non-commissioned officers and men is not yet quite sufficient, but will be provided.
Officers' Quarters.	1. The officers live in a line of bungalows running north and south, and each bungalow is situate in a separate compound. The ventilation is good. Drains run along in front and rear of the compounds to carry off the water, and also along the sides, where it is necessary to make watercourses. The arrangements to keep these clear are in the superintendence of the executive engineer, and are well attended to.
IV. Health of the Troops.	1. The station, generally speaking is healthy, and the same may be said of the district. The native population are usually healthy, except during the season of fevers and when epidemics prevail. 2. The most prevalent diseases among the native population are, fevers, dracunculus, small-pox, dysentery, and diarrhœa. Diseases of the spleen are of common occurrence after fever. Cholera occasionally makes its appearance, but more rarely than in most parts of India; there has not been a case for three years. 3. The healthiness of the native population is attributable to the superiority of the climate. 4. The 3rd Troop Horse Artillery came from Persia and Kurrachee. It joined General Roberts' camp before Kotah in March 1858, and was employed on field service in Central India, and came into cantonment on the 28th April 1859. It has received many volunteers from other regiments to replace those who took their discharge. Since arrival here the principal diseases have been dysentery, fevers, and rheumatism. The 8th Hussars arrived in Bombay from England, and were sent up into Rajpootana on field service. This is the first cantonment occupied by the regiment, and one squadron is at the station of Neemuch. They arrived at Kotah on the 28th March 1858. H.M.'s 28th Regiment was quartered in Bombay for about 13 months, and left on the 24th January 1860. The general state of health of the men in Bombay from May 1859 was decidedly bad, the prevailing diseases being fever and bowel affections; asthenic and cachectic conditions of constitutions became thoroughly established, and the health of the regiment undermined. It was subsequently removed to Poona, where the head-quarters arrived on the 24th January; the left wing having been sent to Ahmednuggur some time previously. At these places some amendment took place, when the regiment was ordered to Nusseerabad. The march of the head-quarters commenced from Poona on the 17th February, and was not completed till the 12th May 1860, when the hot season was prevailing. On arrival at Nusseerabad the health of the men was very indifferent, they have since chiefly suffered from attacks of fever, and relapses have been frequent. There was one bomb-proof barrack

Nusseerabad. Bombay.	References to Subjects and Queries.	Replies.
	IV. Health of the Troops—*cont.*	that was occupied by the Hussars, that was considered rather unhealthy, it had been a sick horse stable, and was used as a barrack on the emergency. The floor has since been flagged, and there is not so much objection to it. There is ample accommodation for the Hussars without it. 5. Troops are not usually camped out, but during the period of the mutinies, the 3rd Troop Horse Artillery, the 8th Hussars, the 4th Co. 3rd Battery of Artillery, the 1st Lancers, H.M.'s 83rd Regiment (now at Belgaum), and the 12th Regiment Native Infantry were constantly on field service. The 12th Native Infantry were stationed at Deesa before coming to the station, and the head-quarters were there for one year and nine months. Five companies came to Nusseerabad and Neemuch six months earlier. 6. No experience of hill stations. 7. From general observation we (the committee) should say that troops would be less liable to attacks of febrile and other diseases on returning to the plains, provided they have resided on the hills a sufficient time to acquire strength and throw off the attacks in the first instance. 8. We have had but little experience on the subject, but would certainly say it would be advisable to select hill stations for troops. 9 to 13. No experience with troops at hill stations. 14. As a general rule, the longer troops can be located on hill stations the more conducive it would be to their health. Frequent change of station in the plains is beneficial. Men weary of being a long time at the same station, and long for change. 15, 16. No experience of barrack accommodation or sanitaria at hill stations, or what ranges of elevation are most suitable for such stations. 17. With regard to the question as to whether there is any higher ground near the station which could be advantageously occupied as a hill station; the hill fort of Tarra-ghur, 15 miles distant, rising 1,000 feet immediately above the city of Ajmere, and about 3,000 feet above the level of the sea, has very limited space on it, and there would not be room for more than three barracks, to contain one company each. This year it is under trial as a sanitarium, and the reports of it are very favourable. The temperature of it is much lower by day, and is usually from 8° to 10° lower than in the plains. The nights are almost invariably cool, being 17° lower. There are two pathways, one very precipitous, accessible only to men on foot; the other is more circuitous, but mules, camels, and pack-bullocks can go to the summit. In case of permanent occupancy this road would have to be improved. 18. A dry gravelly surface with a percolating subsoil for stations will be found most favourable to health, but however satisfactory the condition of the surface may be, if the subsoil retains moisture and the temperature is high, malaria will be more or less abundant according to the degree of heat and amount of previous saturation of the ground. 19. The best age for soldiers proceeding to India is 22 years of age, or whenever their constitution is formed by attaining full growth and strength; and the best period for them to land there is in the months of November, December, and January. If there are barracks available at the station where troops land, they are marched into them; if not and the troops are destined to go up country, they are encamped. Their clothing must, in the first instance, be such as they have brought with them; drills and duties depending on commanding officers; or if a regiment garrisons the place it lands at, it furnishes such guards as are ordered by the commandant's authority. Troops on landing should not be detained in Bombay, but marched to some healthy station, such as Poona; they should also be furnished with light clothing suited to the climate, and a helmet and puggree to wear round it. A depôt has been established at Khandalla, where drafts for regiments are to be sent. 20. Troops should be sent direct from home to India when their health and strength is at the best. European troops should be sent to the hill districts on landing, to accustom the men to the climate, and to all the new habits of life, absolutely requisite to be acquired for preserving health in the altered circumstances in which the soldiers are placed, with regard to food, clothing, and temperature. These circumstances, on first landing in India, under the present system, become fruitful causes of disease, when predisposition has been established to a certain degree by the greatly elevated temperature. 21. The mode of transport to the interior can be more effectually explained by the quarter-master-general's department. The troops should be exposed as little as possible to the sun, and all reliefs and movements should take place during the cold weather, *i.e.*, in the months of November, December, January, and February. 22. With regard to the number of years a British soldier should serve in India, it would be advisable to have reliefs every 10 years. Strong healthy men wishing to volunteer might be allowed to do so for a further period of five years, but beyond 15 years it would not be advisable to keep British soldiers in India. 23. In reference to the mode of conducting the business of medical boards as to invaliding; medical committees or boards, both at the Presidency and out-stations, have rules and regulations for guidance, and they work perfectly satisfactorily. 24. The best time for invalids to leave India for home is during the months of January, February, March, and April.
	Diseases.	1. The Europeans are inspected once a week for the detection of local affections and any ailments indicated by the countenance or skin. 2. Generally speaking there is no scorbutic disease among the troops, but cases have occurred occasionally among the native troops. It is attributable to the want of wholesome diet and good vegetables, which latter are now grown in abundance. 3. The proportion of hepatic diseases during the last 12 months has been 4 per cent. to other diseases. The principal causes are intemperance, atmospherical vicissitudes, and exposure to draughts, after being in a profuse perspiration from exercise. It is said that the transmission of pus or vitiated secretion to the liver from an ulcerated intestine is a frequent cause of hepatic abscess, but of this I am by no means certain, as I have seen frequently

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	ulceration of the intestines without abscess, and abscess without ulceration, and often both combined. The preventives are temperance, a cool atmosphere, careful diet, and the avoidance of draughts after profuse perspiration from exercise. 4. The proportion of dracunculus to other diseases has been $\frac{1}{2\frac{1}{3}}$ nearly; the cause is drinking water which contains the ova. Filtering or straining the water before using it would greatly diminish its frequency, if not altogether do away with it. 5. The proportion of venereal diseases to all other diseases in hospital is $\frac{1}{8}$. It would be very desirable to establish lock hospitals. 6. The troops at the station suffer from intermittent, remittent, and continued fever. *Dysentery.*—Acute and chronic. *Cholera.*—There has been no case for the last three years. *Small-pox.*—Distinct and confluent. *Rheumatism.*—Acute and chronic. In the 3rd Troop Horse Artillery, from 28th April 1859 to 27th August 1860, the total admissions were 422, and the total deaths were 34. The admissions from these diseases are in the proportion of 68 to 211 to the total admissions, and the deaths are to the total deaths as 2 to 4. In the 8th Hussars, from the 21st May 1859 to the 31st July 1860, the total admissions were 713, and the total deaths 19. Admissions from the above diseases to total were 231 to 713, and deaths to total deaths 13 to 19. In the 1st Bombay Lancers from 1st March 1857 to 31st August 1860, the total admissions were 1,776, and the deaths 11. Admissions from above diseases to total admissions were 161 to 296, deaths to total deaths 4 to 11. In Her Majesty's 28th Regiment for the quarter ending 30th June 1860, the total admissions were 482, and total deaths 5. Admissions from the above diseases are to the total admissions as 263 to 482, and the deaths are as 5 to 0. In the 12th Regiment Native Infantry, from 1st December 1857 to 27th August 1860, the total admissions were 2,561, and the total deaths 15. Admissions from diseases named above are to the total as 1,385 to 2,561, and deaths to total deaths as 6 to 15. In the depôt Company 4th Battalion Artillery, from 1st December 1857 to 27th August 1860, the total admissions were 493 and deaths 4. Admissions to total admissions were 252 to 493, and the deaths to total deaths were 1 to 4. 7. Small-pox, chicken-pox, and measles are the most frequent zymotic diseases, and they are most prevalent during the months of April, May, and June, when the heat is very great, with hot winds blowing from the south-west. The bazaar is tolerably well drained, and, in most parts, well ventilated. There are a number of wells, but of brackish water. Care is taken to keep the bazaar clean, and, considering the amount of population (upwards of 15,000), there has been very little sickness in it. There are no peculiar habits among the troops or native population which predispose to these diseases; they are incidental to the country. 8. The prevalence of epidemic disease is not influenced by the soldier's duties and occupations in barracks, but when undergoing fatigue in the field the soldier is more liable to the influence of those diseases. 9. Small doses of quinine have not been tried here as a prophylactic against malarial diseases. 10. Great precaution should be taken in keeping the cantonments clean; removing all vegetation from the vicinity of the barracks; having always an abundant supply of water for the men, for washing purposes; providing roomy accommodation for the troops, so that the barracks may not be crowded; being very particular in the inspection of the rations supplied to the men, and should the epidemic be cholera or small-pox, to allow of as little communication as possible between the bazaar and the barracks. It may be necessary in some cases to remove the troops, or a portion of them, to another encampment, where the disease is not so prevalent.
V. Intemperance.	1. The soldiers at the station are usually temperate, and there are very few drunkards. 2. The medical officers find that it is very difficult to say what is the proportion of admissions into hospital from diseases caused directly or indirectly by intemperance, as it does not prevail to any extent, and there are no absolute temperance men, that is, men who abstain totally. Drunkenness is always punished as an offence. 3. Distilled spirits, *i.e.*, arrack or rum supplied by Government, are sold at the canteen, but not in the bazaar to European soldiers, and the quality is good. A man may draw one quart of porter and one dram of arrack daily; or two drams of arrack and no porter. Spirit is no part of the ration for soldiers at the station, on march, or in the field. The men are not allowed a dram in the morning. Spirit is not, as a rule, given as a ration to convalescents; it depends upon the medical men to recommend it or otherwise. No other drinks are sold at the canteen which are injurious to health. 4. A moderate use of spirits is not injurious to men in health. Whether it should be given or not to convalescents depends upon the individuals. The use of spirit has no effect on efficiency and internal discipline, but the abuse would be detrimental. 5. The moderate use of spirits is not injurious; to abolish it altogether would be objectionable, as in so exhausting a climate as India a certain amount of stimulant is required. 6. Either malt liquors or wines may be taken with benefit or be injurious, according to the constitution of the men using them. Wines are not within the reach of soldiers; malt liquors also are expensive, and not procurable when on field service or on the line of march. There remains the spirit ration, which it is better that the men should receive of a wholesome quality from the canteen than drink such as is procurable in the villages. 7. Tea, coffee, and ginger-pop are used at the station, but lemonade and soda-water are too expensive except when supplied at the public expense in the hospitals. With regard to their effect on health, efficiency, and discipline, as compared with spirits, it is the abuse and not the use of the latter which affects the former. 8, 9, 10. It would not be beneficial to abolish the spirit ration, whether for soldiers or convalescents, and to substitute for it beer, tea, or coffee, &c., neither would it be beneficial to prohibit the sale of the former in the canteen, and permit only the latter to be sold there. No recommendations to suggest.

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References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	11. The canteen and bazaar regulations is very voluminous; they are contained in Section X. of the 3rd Appendix of Jameson's Code, a copy of which the committee suggest should be forwarded to the Royal Sanitary Commission.
VI. Diet.	1. The ration for Queen's troops and European troops in the Indian army is the same, and consist of 1 lb. bread, 1 lb. meat (beef or mutton), $\frac{5}{7}$ oz. of tea, $2\frac{1}{2}$ oz. sugar, 4 oz. rice, 1 lb. vegetables, $\frac{1}{2}$ oz. salt, 1 dr. pepper, and 3 lbs. of wood daily per man. The rations are inspected every morning by the orderly officer, and quartermaster, and mess orderly and corporal of each troop or company, and if disapproved of, a committee of three officers inspect it. 2. A complete ration, including vegetables, is provided, and the troops have three meals a day; there is, however, a slight difference of time between the different regiments,— Breakfast being from 7 a.m. till 7.15 a. m. Dinner „ 12 noon „ 12.45 p.m., and Supper or tea „ 5 p.m. „ 6.15 p.m. The value of a full ration is 3 annas and 4 pice per diem, which the soldier is entitled to receive as compensation when the ration is not supplied. The proportion of vegetables in a ration is 1 lb. 3. The vegetable element, though sufficient in quantity, is too frequently, in this country, deficient in anti-scorbutic properties. The fruits and vegetables, *e.g.*, limes and oranges, cabbages and radishes, the highest in the scale as prophylactics, are not to be procured in any quantity during the hot season; or the natural families to which they belong (aurantiaceæ and cruciferæ) will not flourish at all in some localities; it therefore becomes a question whether in such stations as Nusseerabad and Deesa it would not be conducive to the general health to issue a certain proportion of lime juice as a ration during the months of April, May, June, and July, in addition to the onions, pumpkins, and bad potatoes, all of comparatively small value as preventives of scurvy. It will usually be found that the scorbutic tendency will manifest itself after the hot season, and before fresh vegetables have become sufficiently abundant to be easily procurable. 4. The means available for cooking are, cooking pots, gridirons, stew and frying pans, spits, &c. Being of copper, they are tinned regularly once a month. The kitchens cannot be said to have a very clean appearance in this country, inasmuch as there are no chimnies to the cook-houses, and the walls are generally blackened by the smoke, which makes its escape from various apertures, which also serve the purposes of windows. The apertures, together with the doors, form the means of ventilation. The kitchens to two new barracks, lately built, are of different construction, having an upper ventilating roof, with a clear space of two feet for the egress of smoke. The food is both boiled and roasted. The cooking seems to meet with very general approval, and is perhaps as varied as it is possible to be. In addition to the soup, the daily ration of meat is sufficiently ample to admit of small messes in each company, such as kabobs, chili fry, mutton pie, Irish stew, curry, and beef-steak pudding. The tea is reasonably good, and very many of the men are in the habit of taking coffee early in the morning. Tea and coffee can always be obtained by the men before a march, and advantage is almost always taken of the refreshment. 5. Gardens for the cultivation of vegetables by the soldiers are already established. The 28th Regiment and the Horse Artillery have gardens for that purpose. The men are allowed to cultivate plots on their own account, or may cultivate larger plots in partnership.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress and accoutrements in the Hussars, are a wicker helmet, full-dress tunic, cloth overalls, stable jacket, forage cap with cover, white summer tunic, white overalls, cloak, sword, and carbine, pistols for troop serjeant-major and trumpeter, pouch and sword belts, and six-revolvers for non-commissioned officers, Wellington boots and spurs, shoes, and sabretache. In the infantry, one great coat, one cloth tunic, one pair of black cloth trousers, one serge frock, one pair of blue serge trousers, one wicker helmet with padded cover and turban, one forage cap with cover, one pair of English boots, and two pair of country, waist and pouch belt, frog for bayonet, two ammunition pouches and cap pouch. In the Horse Artillery, a full-dress jacket, undress or shell jacket, metal helmet, forage cap, wicker helmet, cloth overalls, cloak, sword, pistol, pouch and sword belts, and pouch, spurs, Wellington boots and country shoes, khakee tunics and overalls. The present dress is suitable to the climate and the soldiers' duties by day and night, if varied according to the seasons. It is also suitable for stations in the hills and plains if varied as found requisite. Malaria does not exist in elevated stations; elevations of 4,000 feet and upwards are supposed to be beyond fever range. Well chosen stations are as free from malaria as the absence from marshes, jungles, and cultivation can make them. In marching, the numerous fires that are generally made around the camp are great preventives of malaria. These fires cannot well be too numerous, and camp followers should be encouraged to keep them up on all route marching; but when troops are in pursuit of an enemy, fires must be repressed.
Duties.	1. It would be of the greatest advantage if every soldier was thoroughly drilled before commencing his career of Indian service. The drill of a recruit in this country is necessarily prolonged over a considerable period from the small portion of each day which can be set aside for the purpose. Many weakly constitutions suffer from even the short daily exposure necessary, or a habit of frequently coming to hospital for trifling causes is acquired, also it may be a permanent distaste for all drill exercise. Instruction in the necessary duties at home would be a suitable service for the young soldier from 18 to $21\frac{1}{2}$ years of age, and would conduce to the development of the frame until the constitution acquired sufficient strength better to withstand the influences of climate. 2. The usual routine of a soldier's duties are—in Her Majesty's 28th Regiment, morning drill from 5 to 6 a.m., three times a week; roll calls, 5 to 5.30 a.m., twice a week; medical inspection 5 to 5.50 a.m. once a week. Divine service, one hour every Sunday. Evening roll call from 5 to 5.30 p.m., daily. Morning ditto, in barracks, at 10 a.m. daily, except

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*Duties—cont.*	Sunday. When the barracks are inspected and the men paid, on Wednesday evening a marching order parade. In the Horse Artillery there are field exercise parades from 1½ to 2 hours; sword drill half an hour; field piece drill 40 minutes; marching drill ¾ of an hour; heavy ordnance drill 40 minutes; equitation drill one hour; stables, morning and evening, one hour each; also duties, guards, night pickets, and day line duties. In the Hussars they have field drill, mounted, from 1½ to 2 hours; skirmishing, advance and rear guards, and posting pickets from 1½ to 2 hours; sword and carbine exercise for ¾ hour; riding drill, under riding master, one hour; also duties, guard, and night patrol. The men do not suffer from drill, provided judgment is exercised in not working them at sickly periods, or exposing them to the sun in hot weather. The best hours for drill and parades are from 4.30 a.m. to 5.30 a.m., according to the time of year, and the same hours for the evening. Marches must be regulated according to the distance. In hot weather troops should not be out later than 7 a.m. The march of cavalry may be calculated at 3¾ miles per hour, and of the infantry at 2¾ miles per hour. The Hussars have 8 nights in bed; the Horse Artillery have 5 nights; the 28th Regiment 10 nights; the 1st Lancers 1¾ nights; the 4/3 Artillery 3 nights; and the 12th Regiment Native Infantry 4½ nights in bed. 3. The 28th Regiment have three guards, at distances of 812, 1,000, 1,625 yards from the barracks; all other European guards are regimental, and within the limits of their own lines. Day guards last 24 hours; night guards or pickets mount at sunset and are relieved at daybreak, the time varying according to length of day. There are two roll calls by day and one by night. Night guards have no bad effect on health.
VIII. Instruction and Recreation.	1. The following are the means of instruction and recreation at the station. There is one ball court, but there should be two others for the 8th Hussars and 28th Regiment. There are some skittle grounds, and others will be made. Schools, with schoolmasters, exist, but school-rooms have to be built. There are also libraries, and portions of barrack accommodation are used as reading-rooms; proper accommodation is not yet provided. No day rooms or soldiers' clubs are established; but there are soldiers' gardens, worked by the men, according to their own fancy. There are no workshops; except the usual regimental ones. There is a theatre, and soldiers constantly perform in it, and there is also a gymnasium, where both officers and men meet once a week to play cricket, quoits, and skittles. Races, both pony and foot, take place, and also jumping and other gymnastic exercises. When a sufficient fall of rain has occurred, so as to cool the earth and cause vegetation, the rainy season is not usually hot, and the days being often cloudy, the men can take outdoor exercise with impunity. There are sources of amusement enough to occupy them, but it would be a great benefit if workshops of different descriptions were established, in which the men might be encouraged to work at such trades as they may have acquired, and be remunerated for their labour. There is restriction against exposure to sun and rain out of barracks when off duty, when considered necessary, and the object is to preserve health. 2. There should be two double ball courts erected, one for the European infantry and one for the cavalry regiment at the station. Avenues of trees should be so planted as to give shelter for skittle and quoit grounds, for air and exercise are absolutely necessary to many men for the preservation of health. Good reading rooms should be built. Workshops of various kinds, such as tailors', shoemakers', carpenters', joiners', and watchmakers', should be established, and as much regimental work as possible should be done in these shops. Government work should be given to them to the extent of their ability to execute without detriment to their duties as soldiers. Where the heads of trades are not nominated by Government, the different trades should be allowed to select their own master. Work must be allowed to be entirely voluntary; the men to be permitted to work for as long or as short a time as they like. No coercion should be used, and the remuneration to depend on the amount of labour. 3. Savings' banks are already established, and have proved advantageous. 4. There is not sufficient shade from trees or other means to enable the men to take exercise without injury to health during the day. This has only become a station for Europeans since the commencement of the mutinies.
IX. Military Prisons.	1. There is a new range of cells built for the European regiment of infantry, and which are at present used by the European cavalry regiment also. The range requires a verandah to its west side, that face being exposed to the heat of the sun and to the scorching hot winds during the hot season. These are solitary cells, and therefore cannot be crowded. The only other places of confinement are the prison rooms of the quarter guards of regiments. When men are sentenced to long periods of confinement and hard labour, it is requisite to send them to Bombay.
X. Field Service.	1. There are no local regulations for field medical service not included in the General Presidency Regulations, which latter are strictly enforced. 2. The medical officers on field service or the line of march have little or no power. On the line of route from station to station encamping grounds are defined by the quartermaster-general's department; they are usually the most healthy spots, affording abundant supplies. When moving after an enemy, the route, of course, depends upon the direction the enemy have taken. To this, of course, the medical officers can have nothing to say. In ordinary marching, should the men feel fatigued, the medical officer might recommend a halt whenever requisite. If troops are encamped on the same ground for any length of time, the medical officer may recommend a change of site for sanitary reasons. It is his duty to make requisitions for the carriage of the sick as such is required. 3. As before observed, encamping grounds on the line of route from station to station are laid down by the quartermaster-general's department as the most eligible in every respect. Water is brought to the tents and hospitals by the water-carriers, of whom there is an increased establishment to every regiment when on field service or on the line of march. Ventilation is always well preserved by pitching the camp, where circumstances admit of it,

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References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	in as open and airy a position as possible. The power of the medical officer is confined to the charge of the sick, and any suggestions he may make regarding them should always meet with attention. The rules and regulations for route marching are explicit, and only require to be attended to. 4. The arrangements in the Presidency for field hospitals, transport of sick, &c., are laid down in the Presidency code of Regulations for the medical department.
XI. Statistics of Sickness and Mortality.	The information under this head is given in the following table:—

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European Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per cent. to Strength. Treated.	Ratio per cent. to Strength. Died.
	Queen's Troops.																					
1857-58	3/14 Royal Artillery - H.M.'s 83rd Regiment - Do. 95th do. -	453	435	4	13	2	32	2	17	1	68	2	14	2	3	2	263	—	845	15	186·5	3·3
1858-59	Do. 8th Hussars - Do. 83rd Regiment -	1,301	1,198	23	9	—	81	3	33	4	361	20	71	22	—	—	1,397	6	3,200	78	245·9	5·9
1859-60	Do. 8th Hussars - Do. 83rd Regiment -	1,658	1,179	12	4	—	114	4	67	7	333	12	49	4	4	—	1,553	2	3,303	41	199·2	2·4
	European Troops in the Indian Army.																					
1850-51	3rd Co. 2nd Battn. Artillery -	104	58	3	1	—	6	—	2	—	56	4	10	—	3	—	142	1	277	8	266·3	7·6
1851-52	3rd do. do. -	102	69	—	1	—	7	1	6	—	28	—	6	—	2	—	141	—	259	1	253·9	0·9
1852-53	3rd do. do. -	110	90	—	1	—	4	—	7	1	35	1	15	—	1	—	134	—	286	2	260·0	1·8
1853-54	2nd do. do. - 3rd do. do. -	116	60	1	1	—	2	—	5	—	22	—	8	—	—	—	122	—	210	1	181·0	0·8
1854-55	4th do. do. -	115	90	3	1	—	1	—	1	—	39	2	6	2	—	—	85	1	222	8	193·0	6·9
1855-56	4th do. do. -	105	49	2	—	—	—	—	3	—	12	—	8	—	—	—	42	—	114	2	108·5	1·9
1856-57	4th do. do. -	99	18	—	1	—	1	—	6	—	16	1	5	—	—	—	86	—	133	1	134·3	1·0
1857-58	2nd Troop Horse Brigade -	69	115	—	1	—	6	—	2	1	11	1	2	—	—	—	68	—	205	2	297·1	2·9
1858-59	2nd do. do. -	141	133	2	1	—	5	—	14	1	43	3	10	—	1	—	145	1	357	7	253·1	4·9
1859-60	3rd do. do -	122	54	1	1	—	10	—	11	—	25	1	—	—	2	1	182	—	285	3	233·6	2·4

Native Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per cent. to Strength. Treated.	Ratio per cent. to Strength. Died.
1850-51	1st Regiment Light Cavalry - 21st do. Native Infantry 23rd do. do. -	1,884	1,221	8	2	—	27	1	7	—	181	4	14	3	1	—	923	4	2,376	20	126·1	1·0
1851-52	1st do. Light Cavalry - 21st do. Native Infantry 23rd do. do. - 3rd do. Light Cavalry -	1,930	947	5	4	—	14	2	8	1	159	2	9	—	—	—	993	1	2,134	11	110·5	0·5
1852-53	3rd do. do. - 21st do. Native Infantry 23rd do. do. -	1,973	1,238	9	18	—	24	3	6	—	169	3	20	—	—	—	873	1	2,848	16	119·0	0·8
1853-54	3rd do. Light Cavalry - 7th do. Native Infantry 10th do. do. - 21st do. do. - 23rd do. do. -	1,760	877	5	20	—	37	1	2	—	137	2	25	—	1	1	763	2	1,862	11	105·7	0·6
1854-55	2nd do. Light Cavalry - 3rd do. do. - 7th do. Native Infantry 10th do. do. -	1,839	1,527	2	15	—	56	4	5	—	161	3	12	1	—	—	1,157	2	2,933	12	159·4	0·6
1855-56	2nd do. Light Cavalry - 7th do. Native Infantry 10th do. do. -	2,039	979	2	13	—	53	1	3	—	233	3	29	1	—	—	1,083	5	2,393	12	117·3	0·5
1856-57	1st do. Light Cavalry - 2nd do. do. - 7th do. Native Infantry 10th do. do. -	2,020	803	2	15	—	77	1	17	—	207	2	20	1	—	—	1,106	4	2,245	10	111·1	0·5
1857-58	4th Co. 3rd Battn. Artillery - 1st Regiment Light Cavalry - 12th do. Native Infantry	625	424	2	4	—	13	1	5	—	62	—	19	1	—	—	485	5	1,012	9	161·9	1·4
1858-59	Detachment 1st Co. 4th Battn. Artillery. 4th Co. 3rd Battn. Artillery - 1st Regiment Light Cavalry - 12th do. Native Infantry Detachment 13th Regiment Native Infantry. 3rd Co. Sappers and Miners -	1,072	821	2	6	—	47	2	4	—	119	—	21	—	—	—	757	5	1,775	9	165·5	0·8
1859-60	4th Co. 3rd Battn. Artillery - 1st Regiment Light Cavalry - 12th do. Native Infantry	1,247	917	3	4	—	39	1	4	1	88	2	18	1	—	—	832	1	1,902	9	152·5	0·7

WOMEN AND CHILDREN.

Years.	CORPS.	WOMEN.									CHILDREN.								
		Strength.			Treated.		Died.		Ratio per Cent. to Strength.		Strength.			Treated.		Died.		Ratio per Cent. to Strength.	
		European.	Indo-European and Native.	Total.	European.	Indo-European and Native.	European.	Indo-European and Native.	Treated.	Died.	European.	Indo-European and Native.	Total.	European.	Indo-European and Native.	European.	Indo-European and Native.	Treated.	Died.
1852-53	3rd Co. 2nd Battn. Artillery - -	12	1	13	34	1	—	—	269·2	—	21	2	23	18	—	—	—	78·2	—
1853-54	3rd do. do. - -	10	2	12	12	—	1	—	100·0	8·3	21	3	24	20	—	—	—	83·3	—
—	4th do. do. - -	9	7	16	—	—	—	—	—	—	15	4	19	—	—	—	—	—	—
1854-55	4th do. do. - -	7	7	14	11	4	1	—	107·1	7·1	20	4	24	17	3	—	1	83·3	4·1
1855-56	4th do. do. - -	7	7	14	3	4	—	—	50·0	—	16	4	20	3	—	—	—	15·0	—
1858-59	2nd Troop Horse Brigade - -	3	2	5	—	—	—	—	—	—	8	—	8	—	—	—	—	—	—

By order of the Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department, Bombay, 22nd December 1860.

W. C. COLES, Assistant Surgeon, Secretary.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1, 2. At present there are no regular hospitals for European troops, with the exception of one for the troop of Horse Artillery. Barrack buildings are occupied by Her Majesty's 8th Hussars and 28th Regiment as hospitals, and they are in every respect like the other barracks. The hospital of the Horse Artillery is situated 850 yards from the nearest point of the bazaar, and due west from it. The hospital of the 28th Regiment is 1,000 yards distant from the same point west north-west, and the hospital of the 8th Hussars is 2,500 yards north-west by north. Plans and estimates for a suitable capacious European hospital have been called for, and when sanction has been given the buildings will be commenced. The site is open and freely ventilated, and equally healthy as to elevation and freedom from malaria and other nuisances with the rest of the barracks. 3. An ample supply of good water is brought to the hospitals daily by bheesties. 4. The drainage is the same as described with respect to the rest of the barracks. 5. The floor of the hospital is raised 1 foot 6 inches above the surface of the ground. There is no perflation of air underneath the floors, which are all solidly constructed. The roof water runs off. The rain which falls on the buildings (the foundations of which are slightly raised) is carried off by the inclination of the ground on each side to small channels partly natural and partly artificial, which all tend ultimately to the western slope of the very gentle undulation, on the highest part of which the barracks are built. The materials of construction of the hospitals are the same as the barracks, and they are similarly supplied with verandahs. When the number of sick exceeds 85, the least important cases occupy the verandahs, together with any men detained in hospital in consequence of trifling ailments. The hospital consists of one flat only. Table of hospital accommodation. The date of construction of the present Artillery Hospital, formerly the Church bungalow, is unknown. (The church was built about 35 years ago and was adapted for hospital purposes since the mutinies). Total number of wards, 8. Total regulation number of beds, 41.

Wards or Hospital Huts. Number.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.					Feet.	Feet.
Main room - -	14	60	17·82	20	21,384	1,527	76	18 inches.			
Verandah, 1 - -	6	60	11·82	17·5	12,425	2,070	118	„			
Do. 2 - -	6	46	11·82	17·5	9,525·8	1,587	90	„			
Do. 3 - -	6	79	7·75	13·5	8,265·3	1,377	102	„			
Do. 4 - -	6	58·66	7·75	13·5	6,137·3	1,022	75	„			
1 room marked "A" on plan.	Surgery	13	11·82	17·5	2,692						
2 Do. "B," each -	1	17·82	7·75	13·5	1,864·4	1,864	138	„			
4 Do. "C," each -	1	11·82	7·75	13·5	1,236·6	1,236	19	„	3	4·0	3·25
1 Do. "D," each -	1	19	7·75	13·5	1,987·8	1,987	147	„	1	2·5	1·82

The whole range of barracks is admirably placed so as to receive the full benefit of the prevailing wind during the hot weather. The windows open upwards, and their arrangement and construction are conducive to ventilation.

6. The means of ventilation are ample, and consist of doors, windows, and apertures in walls. There are no jalousies or jhilmils.
7. The hospitals are cooled in the same manner as the barracks.
8. There are no means of warming the wards other than by closing the doors and windows. The walls and ceilings of the wards are cleansed and limewashed as often as the requisition is made.

NUSSEERABAD. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	9. The ordure is removed from the privies several times a day by sweepers, and the privies are soused with water, and the cesspool into which urine falls is emptied daily. They are not offensive. 10, 11. The lavatory arrangements of the hospital are said to be insufficient, but it must be borne in mind that the barrack is only temporarily fitted as a hospital. The means of ablution for sick men are certainly inconvenient as far as the lavatories are concerned. There are four wooden tubs and four gindees to each lavatory; there are also 40 crockery basins for washing purposes in the hospital. 12. There is an establishment of three washermen to each European regiment, who wash and dry the linen; they have always been considered sufficient. 13. The storage is said to be insufficient, the hospitals to each regiment being temporary. 14. The bedsteads in use in the hospitals are chiefly wooden charpoys, laced with broad cotton tape, but there are also some iron cots. The mattresses and pillows are stuffed with straw. The sheets and coverlids are of cotton, and the blankets European and country. 15. The kitchens are the same as those to the other barracks. The fire-places are of stone and mud plastered with lime, and the means for cooking consist of cooking pots, gridirons, frying pans, and spits. They are sufficient for the purpose. The diets are properly cooked, and varied as circumstances permit; but the want of good vegetables is sometimes felt. 16. The diet rolls, tables, &c. are according to the Medical Code of the Bombay Presidency. 17. By the regulations the following establishment is allowed to a regiment of European cavalry or infantry, or a battalion of artillery complete:— 1st class servants—1 apothecary, 1 steward, 1 assistant apothecary and steward, 3 apprentices, and 1 serjeant. 2nd class hospital servants—1 matron, 1 assistant ditto, 1 native writer, 1 compounder, 1 dresser, 2 stewards' servants, 1 shop servant, 10 ward coolies, 5 bheesties, 3 dhobies, 2 tailors, 5 sweepers, 1 head cook, 2 assistant cooks, 1 leech man, 1 barber, and 10 dooly bearers. 18. No epidemics have broken out in the regimental hospitals, nor have hospital gangrene or pyæmia appeared. 19. The hospitals should be larger, better raised, and better fitted up, but as has been observed the buildings are only temporarily occupied as hospitals. 20. The convalescent system cannot be satisfactorily carried out, inasmuch as there are no wards for the purpose. When men have been discharged from hospitals, however, they are considered at convalescents in barracks, placed on barrack rations, paraded every morning for inspection at hospital, and marched out under a non-commissioned officer for morning and evening exercise. 21. In the 28th Regiment two compartments of the married men's quarters are set aside as a hospital for the sick wives and children of the men of the regiment. In the 8th Hussars they are attended at their own quarters. The hospital arrangement for this purpose is incomplete, regular hospitals not having yet been built. 22. There are no local hospital regulations which are not included in the General Presidency Medical Regulations. 23. The control of the medical officer is complete as regards change of diet and consumption of medical comforts, and whenever repairs are required to hospital or its out-offices, his requisitions are always attended to. 24. With regard to accommodation for convalescents, a proper European hospital has not yet been provided. By the regulations there should be both a convalescent and a female ward, and there will be great advantage from such accommodation.
XIII. BURIAL OF THE DEAD.	1. The graveyard is 812 yards from the nearest point of the lines, which are those of a native infantry regiment on the extreme left, 1,250 yards from the Horse Artillery lines, 1,750 yards from the nearest barrack of European infantry, and 3,000 yards from the nearest barrack of the 8th Hussars. It lies due west from the nearest point; south-west from the centre of the lines, and south-south-west from the lines on the extreme right. The prevailing winds are from the south-west. 2. The burial ground is almost a square; its area is 29,172 square yards; it is enclosed by a wall and is carefully kept. Water percolates into the subsoil or evaporates. 3. The graves are 7 feet long, 3 feet broad, and 6 feet deep, with an interval of 3 feet between each. They are never re-opened. The hours of burial are 6 a.m. and 5.30 p.m.; those dying during the night are buried the following evening, and those that die during the day on the following morning. This is a general rule, but interments frequently take place at lesser intervals, and during epidemics as quickly as arrangements can be made. The natives burn their dead in the morning after sunrise and in the evening just before sunset. Incremation takes place as soon as possible. 4. The grave yard has never as yet proved offensive, though it is to the windward of the camp. It will, however, be necessary to remove it to another position before long, as the garrison of this station has been increased by two European regiments beyond what were ever cantoned here before. British troops are buried with funeral honours. 5, 6, 7. With regard to the disposal of the dead of camp followers and bazaar people, Mahomedans bury them, and their principal burying ground is 2,000 yards from the nearest barrack, and direct eastward of it; the smaller burial ground is 820 yards from the centre of the line of barracks, and due west from it. A large proportion of the Hindoo population burn their dead; their burial ground is 1,650 yards due east from the bazaar, and 3,250 yards from the nearest point of the lines, which are on the left. No injury to the public health has as yet accrued from the present practice, and no improvement in the mode of burial is suggested.

(Signed) J. HOLMES, Lieut.-Colonel,
Commanding at Nusseerabad.
A. DURHAM, M.D., Surgeon-Major,
H.M's. 1st Bombay Lancers.
JULIUS G. T. GRIFFITH, 2nd Captain, Acting Executive Engineer, Nusseerabad and Neemuch Division.

22nd September 1860.

DEESA.

Accommodation - { European Troops - { Artillery, one troop, horse - 184 / Infantry, one regiment - 928 } / Native Troops - { Cavalry, one squadron - 151 / Infantry, one regiment - 930 } }

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is flat and sandy, gradually sloping from north southwards, sufficient only to convey the water of rivers rising in northern Rajpootana to the Gulf of Cambay. There is no wood, jungle, or water in the vicinity. 2. The station is said to be about 400 feet above the sea-level. It is on the same level as the adjacent country generally. The present cantonment not being on equal ground, the adjacent race-course presents a better spot. Its elevation is equal to that of the highest portion in cantonment, and its space is ample. 3. The nearest high land is the Jassore range, running through Rajpootana from north south-westerly, and terminating within 15 or 16 miles of Deesa. Mount Aboo is the highest point near Deesa, it is believed. The trigonometrical survey not having been published, its height is not exactly known. 4. The nearest water is the river Bunnass, which bounds the western side of the cantonment. The vicinity is not liable to overflow of water. There are many ravines but no water pits. 5. The station is open and freely exposed to the winds, but in some parts of the cantonment the arrangement of the buildings prevents the full benefit of exterior ventilation being felt. The temperature is not raised by reflected sun heat. The S.W. wind or sea breeze blows from about the middle of March to the end of June, but reaches this station as an exceedingly dry scorching wind; wet and dry bulb thermometers often showing a difference of 30° F. and upwards. Apoplexy not unfrequent at this season. Winds are more variable from the beginning of July to the end of September, but generally from the south and west. This is the wet season, and bowel complaints and fever are the most prominent ailments. Between October and March northerly winds are most frequent, and four months of this period are dry, cool, and bracing. 6. The surrounding country is uncultivated on the western side only. There are no works of irrigation near the station, and no cultivation of either rice, indigo, hemp, or flax. 7. The nearest civil population is the Sudder bazaar, which is inside the cantonment, and suburbs extend outside. The interior population is about 9,000. 8. As to geological structure, the upper soil is white friable earth. The subsoil red earth with limestone. The ground was first cleared for occupation as a cantonment. 9. Water is found at a depth of from 60 to 70 feet below the surface during the dry season, and from 50 to 60 feet from the surface in the wet season. 10. The rain-fall and surface water flows readily away, sinking into the subsoil. The drainage from higher ground on the east flows through the subsoil of the cantonment. 11. The water-supply of the station is derived from wells. There are no tanks. 12. The water is abundant, clear, agreeable, and devoid of smell. Its chemical composition has not been determined, but the saline or mineral ingredients seem to be inconsiderable, and the water would appear to be almost free from organic matter of any description. It is drawn for use in leathern bags, lowered over rollers, and pulled up by bullocks, and is distributed by bullocks and carriers. The wells might be larger in diameter and worked by machinery. Better water cannot be obtained. 13. No other topographical points besides those mentioned above. 14. Not aware of the manner in which stations are selected.
II. Climate.	1. There is a government observatory. 2. The following table gives the meteorology from January 1st, 1857, to December 31st, 1859.

Months.	Barometer Mean.	Mean Temperature.	Mean daily range.	Mean Maximum.	Mean Minimum.	Mean Dry.	Mean Wet.	Mean Sun Temperature.	Rain.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks, Clouds, Dew, Storms, &c.
	In.	°	°	°	°	°	°	°	In.				
Jan. -	29·667	63·9	29·4	79·1	49·6	67·6	57·6	103·9	0·60	N.E.	—	30	Ci, cu, ci-s, moderate agreeable.
Feb. -	29·587	69·8	31·5	85·4	53·9	74·6	61·5	109·1	0·20	N.	—	25	Ci, cu, then clear, moderate, agreeable.
Mar. -	29·561	80·4	32·5	94·1	61·5	84·5	66·9	118·4	—	N.	—	29	Ci, cu, moderate, agreeable.
April -	29·452	86·6	31·0	101·5	70·5	91·8	72·2	126·1	—	W.	—	29	Cu, cu, ci-s, moderate, agreeable.
May -	29·518	91·3	27·9	105·6	77·7	92·5	78·3	126·8	—	S.W.	—	30	Cu, s, ci-cu, moderate, agreeable.
June -	29·347	89·3	21·5	100·2	78·7	89·9	78·9	122·1	3·79	S.W.	—	25	Cu, s, ci-cu, moderate, agreeable.
July -	29·328	87·7	14·6	93·2	78·6	85·4	79·3	120·3	8·62	S.W.	—	20	N, cu-s, high winds, sand and dust.
Aug. -	29·437	82·2	11·6	87·1	75·5	81·1	77·2	106·4	6·21	S.W.	—	17	Cu-s, ½ gales, with clouds of dust and sand.
Sept. -	29·550	82·6	15·2	88·5	73·3	81·9	76·4	114·2	5·15	S.W.	—	24	Cu-s, ½ gales, high winds.
Oct. -	29·677	81·2	30·3	92·7	62·4	83·5	72·0	122·0	—	N.W.	—	30	Ci-cu, ci-s, moderate, agreeable.
Nov. -	29·769	84·1	35·7	89·1	53·4	80·4	64·0	115·5	—	N.	—	29	Ci-cu, cu-s, high winds agreeable.
Dec. -	29·849	68·5	34·4	82·4	48·0	70·6	58·0	108·4	—	N.	—	30	Ci-cu, cu-s, high winds, agreeable.

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. As regards the influence of the climate on health, the extreme heat and dryness of the climate in the hot season are very exhausting, and the atmosphere is often loaded with dust, as much apparently from some electric disturbance or peculiarity as from the force of the winds. During the wet season the fall of rain is inconsiderable, and as the soil is very sandy the water rapidly disappears. There is therefore little excessive vegetation or dampness, and though fever is a frequent disease, yet it is seldom severe, while cases of dysentery are rare. The climate must be considered rather healthy, but it is nevertheless so exhausting that troops should not serve longer than two years at a time in the station. Recruits should not be sent to it till they have been seasoned in the milder climates of Poona, Khandala, or Kurrachee. There are no peculiar precautions necessary as regards clothing, diet, &c. But during the hot winds khakee is too thin a covering to protect the surface against such rapid evaporation, and coats of this material should be made with two folds in the back. From the beginning of April to the end of August the meat is necessarily of inferior quality from the want of grass for the cattle. The healthy months are November, December, January, February, March, and April. The unhealthy months are May, June, July, August, September, and October. The prevailing and fatal diseases during the latter months are apoplexy, fever, and bowel complaints, affections of the liver not being uncommon. 4. In Mount Aboo there is an elevated plain known under the name of "Ooria," near 5,000 feet above the sea, sufficiently large to accommodate at least the wing of a regiment. Ground has been selected on the same hills, about three miles from this plain, as the site of a new sanitarium for 200 men. 5. The stations at which I have served are Gazeepore, Agra, Wuzeerabad, Sealcote, Mhow, and Deesa. Gazeepore and Agra are objectionably situated on the bank of a river, and the latter possesses a very hot climate, and was not at all adequately drained. The ratio of mortality from apoplexy, dysentery, and fever is accordingly comparatively high. Sealkote has hitherto enjoyed a high character for salubrity, and Mhow, both as regards climate and salubrity, has long been a favourite station.
III. SANITARY CONDITION OF STATION.	1. 2. 3. Plans appended. Barracks constructed in 1828. Eleven rooms for 800 non-commissioned officers and men. The following table gives the details:—

Rooms.	Regulation Number of Men per Room.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Beds above Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.	Feet.			Feet.		Feet.	Feet.
3 - - each	80	200	23½	19	89,300	1,116¼	58¾	1 7/12	28	5½	3½
8 - - each	70	176	23½	19	78,584	1,122 6/10	59	1 7/12	24	5½	3½
Guard Room -	various	41	20	16½	13,530	—	—	—	—	—	—
Prison Cells. 12 - - each	1	9	9	11	891	891	81	—	—	—	—

5. The windows are on opposite sides of the rooms, and open outwards. There are verandahs on all sides; average width 10 feet, height 14 feet. They are occupied as sleeping quarters by soldiers at their own discretion. There are venetian shutters to the windows.
6. The bedsteads consist of iron trussels and boards. Bedding, one munda mattrass, with two covers for same; two cotton sheets and two country blankets. The soldier in India is well found in these particulars.
7. Structure of tents unknown. The dimensions of huts now occupied by troops in cantonment are as follows:—Soldier's tent, 14 feet square, with walls 6 feet high, poles 12½ feet high. Cubic contents about 1,580 feet. Superficial area 196 feet. Total occupants 20 (16 men, 4 serjeants), giving 79 cubic and 9·8 superficial feet per man.
   The hospital tent is 16 × 22 feet. Pole 12 feet high. Walls 6 feet high. Cubic contents 2,818 feet, which at 25 men gives about 112 cubic feet per man. Rowties for natives are 14 × 10 × 9 feet high, with semicircular ends. Cubic contents 1,090 feet nearly. Superficial area 293 feet, giving, at 14 men, about 78 cubic and 21 superficial feet per man.
8. Ventilation of barracks is effected by punkahs, doors, and windows, and ventilators in the roof. The ventilation is scarcely sufficient for a crowded barrack.
   Punkahs and tatties are used for cooling the air. The tatties are frames of bamboo, spread over with a layer of roots of "kuskus" grass, placed in front of doors and windows, and kept continually wet by pouring water over them.
9. The barracks are constructed of burnt bricks and mortar. Roof teak wood, double tiled.
10. The floors are of concrete, raised about 2 feet above the level of the ground on the average. No passage for air beneath.
11. As regards construction, loftier barracks would be preferable, and further ventilation in the roof and walls. The floor should be of paved stone, and in no part less than 3 feet above the ground. Arrangements for privies and urinals should be entirely changed, so as to require no underground drainage.
   The barracks are kept in repair by the public works department. Ordinary repairs, or such as are necessary to maintain the buildings, are made annually. Petty repairs are made on requisition by the party in charge of the building. Repairs are executed as quickly as they can be with the labour and materials procurable. Neither are very good.
   The walls and ceilings are limewashed at no stated period. Limewashed whenever required.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	12. To each barrack is attached a washing room. There are no conveniences, however, to show in a sketch. There are two plunge baths (50 feet by 20) for the European regiment, and one smaller one for the troop of horse artillery in the cantonment. 13. (Cook-houses of the usual construction.) Natives are employed as washermen, and the work is done satisfactorily at a charge of 8 annas per month to each soldier. 14. (No description of privies or their mode of drainage, only a sketch appended.) 15. Three oil lamps allowed for each barrack room. Two kept burning all night. 16. Barracks drained by small underground drains about ½ foot square, leading to circular cesspools about 2 feet diameter and 10 feet deep. These last are emptied as found necessary. The drainage is not sufficient. No part of the barrack is damp. The fluid refuse of the barracks sinks into the subsoil. There are no foul ditches near the station. 17. As regards surface cleansing, no refuse or manure of any description is allowed to remain on the surface. Coolies and carts are employed daily to remove any filth which may be deposited between the barracks or on the officers' lines. 18. There is little or no vegetation on the surface of the cantonment, except during the rainy season, and even then it is not excessive as in most other stations, which have a damper climate. Weeds and growth of every kind are cleared away on the recommendation of the station sanitary officer. The ventilation of the station or bazaar is not interfered with by old walls, and hedges are cut down periodically to assigned limits, as well as cleared of grass and weeds. Branches of trees are lopped off annually to a distance of six or seven feet from the ground. 19. The bazaar extends as a single street mainly along the bank of the river Bunnass, which, with the addition of open channels or surface drains, serves to carry off superfluous water. Ventilation is defective, owing to the structure of the houses, and in some places the absence of plan in their relative position to each other. The water supply is abundant and good. Cleanliness is defective, except in the main street. There are no latrines, and the natives resort to distant nullahs, and to the banks of the river. The crowding is in proportion to the poverty of the people, who are ill clad and worse fed; yet there has been no epidemic disease among them during the past year. Every precaution is taken to guard against injury to the public health, by enforcing a habit of general cleanliness throughout the bazaar, as well as by removing every sort of rubbish and filth, the presence of which might induce disease. Dungheaps are a never failing condition of native life in India, and whether there are cesspits depends on the nature of the ground and the state of the weather. Nuisance is experienced in the natives lines from wind blowing over the native dwellings. It could be obviated by taking up other ground for the native lines, which are too close to the bazaar and too confined in space. 20. Animals are slaughtered in the sudder bazaar, close to the river. The skins of the animals are cured near the ground by a rough and summary process. The dung is carried off as manure to the enclosed patches of ground under cultivation along the margin of the river, and the offal is eaten to a shred by the low caste or poorer portion of the inhabitants. 21. The horses of the bazaar people and of camp followers are either picketed in the compounds or premises of their owners, or occupy some portion of their houses set apart as shelter. The same regulations as to general cleanliness are observed, and the salubrity of these stables is preserved by causing the proprietors to remove the manure to a place beyond the limits of the cantonment, from whence it is carried away by the villagers as manure for their fields. 22. The troop horses are picketed in the open in front of the men's barracks, which are in front of the officers' lines, and these last are in front of the hospital. The manure in dry weather is sold. The stabling ground is a quadrangle about 400 feet by 300 feet. It is about 150 feet in front of the barracks, and there are about 1,400 feet in front of the hospital. 23. There are 84 married quarters for the European regiment and 14 married quarters for the troop horse artillery. Married people do not occupy barrack rooms with the men.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is generally good, being kept clean by the occupants. There are no details as to drainage, none being provided. Officers should have quarters provided by the Government, a monthly rent being deducted. A suitable arrangement of officers' quarters in conjunction with the soldiers' lines would tend much to a healthier condition of cantonments; were all quarters Government property, there would be no dilapidated ruins of fallen houses, &c. as are remarkable here.
IV. Health of Troops.	1. The native community is healthy both in this station and in the district generally. 2. The prevailing diseases among the native population are diarrhœa, fever, intermittent and remittent, but spleen disease is not common. Epidemics have not hitherto occurred, but this year cholera has visited many villages in the surrounding districts, and cases of small-pox are occasionally presented. 3. The healthiness of the district is attributable to a dry climate, a sandy, rapidly absorbent soil, good water, absence of excessive vegetation, and of the sudden changes of temperature, which elsewhere, when accompanied with a moist atmosphere and other causes, produce dysentery, fever, &c. 4. The European field artillery, after two years' field service in Central India, arrived at the station in June 1859, in indifferent health, having suffered from fever and apoplexy, and since that date, fevers, boils, and guinea worm have been the most prevalent diseases. The European infantry arrived at Poona in the autumn of 1857, and enjoyed good health till November 1858, the prevailing diseases being fever and bowel complaints; arrived at Deesa in December 1858, and in the early part of 1859, and has since been in indifferent health having suffered from fever, apoplexy, diarrhœa, and cholera. No part of the men's accommodation at the station is obviously more unhealthy than the rest. 5. The troops are not camped out here. 6. I have not been in charge of troops at hill stations.

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References to Subjects and Queries.	REPLIES.
IV. Health of Troops—*cont.*	7. In former times the health of troops resident for some time on the hills was occasionally compromised by want of variety and deficiency of vegetables in the soldiers' rations, as well as by defective conservancy arrangements and indifferent barracks. Scurvy, scorbutic dysentery, general cachexia, and anæmia were the results. Last year a company of the regiment returned to Deesa, after a year's residence in the sanitarium at Mount Aboo, and the men have since suffered from intermittent fever, which they contracted at Aboo, as a consequence of the defective nature of the barracks and their unhealthy malarious position. The only two cases, and both fatal, of heat apoplexy which occurred this year were presented in the same company, the men having been predisposed apparently to the disease by the fact of passing the previous hot season in the comparatively cool climate of the hills. 8. I approve of hill stations for troops. 9. There are diseases peculiar to hill stations. Some of these stations are not beyond the limits of malarious fever, while others predispose to diarrhœa, known as "hill trot." It must be added also, that most diseases of an organic nature are aggravated by hill climates. 10. At hill stations, the precaution as regards shelter and duties must be matter of simple experience, having reference to peculiarities of climate and locality in each case. But defective diet, bad barracks, and imperfect hygienic conditions have hitherto served occasionally to cast some discredit on hill stations. The company above referred to joined the regiment from Aboo not only reduced and anæmic from the influence of the malarious poison, but somewhat scorbutic also, and it appears that mutton was the only meat issued to this company for 12 months. 11. The best period for residence at hill stations is from the 1st April to the beginning or middle of November. The shortest period within which troops could be benefited by a hill residence would be one such season, 12. If detained in the hills for more than two hot seasons consecutively, troops would probably arrive in the plains predisposed to apoplexy, cholera, and the more severe forms of fever; and if the conditions of life have not been favourable in regard to diet, barrack accommodation, and hygienic arrangements, they might bring with them a tendency to dysentery or diarrhœa, and a scorbutic deteriorated state of the blood. 13. Troops should be removed from hill stations in November, and all undue exposure avoided during the ensuing hot season. 14. The highest standard of health would be secured to troops by locating them in the hills from April to November, and in the plains from November to the end of March, alternately. On the plains frequent change of station is beneficial to the spirits, when the change is not from a good to a bad station, for on this point both officers and men are sure to entertain an opinion of some sort; beneficial to health if the march be made in cold weather, and no epidemic disease, such as cholera, prevail, but moving troops late in the season and over cholera-affected districts should be avoided, as likely to cause considerable loss. 15. The barracks and hospitals at Kussowlie and Subathoo are considered defective in structure and plan, and inferior to those at Dugshai. At Aboo, the two barracks have been erected in a malarious gulley, surrounded on three sides by steep high hills, and communicating by a ravine into a large lake, not more than about 200 yards distant, and they are built of temporary materials, wattle and dab. 16. No experience as to the best elevation for hill stations. 17. The nearest hill station is Mount Aboo, 45 miles distant, approached to the foot of the hills by a level sandy road, and thence ascended by a bridle-path in about two hours. The climate has proved favourable to residents, and to the children of the Lawrence Asylum. The elevation varies from 4,000 to 5,000 feet. 18. In India, where surface moisture is such a frequent source of disease, the more absorbent or pervious to water the subsoil for a station is, the more healthy is the station; but no locality should be selected as the site of a station in which the standing point of water is near the surface; and the banks of rivers should be avoided. 19. The best age for a soldier proceeding to India is from 22 to 25; and the best time for landing in India is from November to January. 20. One year's residence in the Mediterranean would be an advantage for troops intended for service in India. As regards the Bengal presidency, it would be advisable to send troops on landing to the hills and to the up-country stations; and in the Bombay presidency it is desirable to locate the troops at Poona, Kirkee, Khandala, or Kurrachee, before sending them into the hotter climates of Central India or Guzerat. 21. No reply. 22. British troops should serve 10 years in India. The mortality in this country is generally high during the first year's service, after which it continues less considerable for some years, while in men between 10 and 15 years' service, the death-rate becomes much increased. 23. As regards medical boards, the opinion of the Station Invaliding Committee is very generally respected by the Presidency Board; but surgeons of regiments should be allowed to keep their invalid list open as late as possible in the year, for, if the Station Committee assemble in October, and men do not proceed to the Presidency till December, it is obvious that some cases in the meantime may present themselves which may with propriety be added to the list. 24. Invalids should leave India for home in the end of January, if sent by the Cape; in the end of March, if sent by the overland route.
Diseases.	1. Disease inspections are held every Saturday morning, or oftener, if necessary. 2. There is no scorbutic disease at the station. 3. The proportion of cases of hepatic disease in the British infantry regiment last year was nearly 4 per cent. of the total admissions; and in the European artillery, not quite 3 per cent. Excessive heat and sedentary habits conduce to the disease. Young men who have not passed a previous hot season in the country, and old residents, are most subject to it. 4. Dracunculus does not appear to be a disease of the district, except very rarely.

References to Subjects and Queries.	Replies.
IV. Health of Troops—*Diseases—cont.*	5. The proportion of cases of venereal disease in the British infantry regiment was 13 per cent. of the total admissions; and in the artillery regiment, 25 per cent. A lock hospital should be established, and put in charge of the staff surgeon of the station. 6. The epidemic diseases at the station are:— *Fever* of the intermittent and remittent types is the most prevalent disease. *Dysentery* is not a common disease at the station. *Cholera* has appeared twice in the British infantry lines since December 1859, and up to this date (August 1860) has carried off about 26 men. *Small-pox* is occasionally seen in the bazaar. *Rheumatism* is not a prevalent ailment. In the British infantry regiment the number of admissions from fever between the 1st April 1859 and the 31st March 1860 was 918, or nearly 50 per cent. of the total admissions; the number of deaths 14, or 48 per cent. of the total deaths. The number of admissions for dysentery was 34, or 1·7 per cent. of the total admissions; the number of deaths 2, or nearly 7 per cent. of the total deaths. The admissions from cholera were 5 and deaths 4, or nearly 14 per cent. of the total deaths. The admissions from rheumatism were 49, or 2·4 per cent. of the total admissions. In the European artillery the admissions for fever during the same period were 18 per cent.; for dysentery, 2 per cent.; for rheumatism, 4 per cent. of the total admissions. No deaths and no cases of cholera. 7. As regards nosological characters:—In the hot dry months of April, May, and June, fever is generally either ephemeral or continued; the latter often complicated with gastric irritation or tendency to head symptoms. In the wet season and autumn the disease assumes the intermittent and remittent forms. Diarrhœa is most frequent in wet weather, and is generally of a painless, watery character, seldom passing into dysentery. Cholera is excessively fatal, marked by early profound collapse, rather than by severe cramps or copious evacuations. These diseases have not been especially prevalent among the native population, and it has hitherto enjoyed complete immunity from cholera. It is true that the sanitary condition of the bazaars and native dwellings is at all times unsatisfactory and imperfect, yet it would appear that the exposure of all descriptions of filth—human excreta—to the free air of heaven is a great improvement to the civilization which implies the use of cesspools, sinks, urinaries, and drains, such as are exhibited at this station. Last year indifferent meat, and the bad description of vegetables, tended to impair the *physique* of the European troops, and the defective conservancy system in use, as regards cesspools, ablution rooms, sinks, urinaries, and drains, may have tended to produce zymotic disease. 8. There is nothing in the nature of the soldier's duties or occupations in the barrack to encourage epidemic disease, or to increase its prevalence on the line of march or in the field. 9. Small doses of quinine have not been tried as a prophylactic. 10. For the mitigation or prevention of epidemic disease, all liquid and solid excreta should be removed direct from the camp twice a day, the fluid from the privies, urinaries, and ablution rooms being received into iron vessels with this view. Sinks, cesspools, and drains should be entirely abandoned in the conservancy arrangements of the station; in fact, should be strictly forbidden, as dangerous to health. Placing the barracks in echellon (instead of in lines one behind another), over an extensive space of ground, would have tended to limit the prevalence of epidemic and zymotic disease in this station.
V. Intemperance.	1. The soldiers at this station are usually temperate. There are about two per cent. confirmed drunkards. 2. The proportion of admissions to hospital, directly or indirectly caused by intemperance, is not more than two per cent. A statistical table, showing the effect of intemperance on disease and crime, cannot be made out with sufficient accuracy, and in any case the result would be valueless, except in connexion with periods of service in the country, for the drunkard is most often an old resident, and long residence in India is itself an element in excessive mortality rates. Drunkenness is punished as an offence. 3. Spirits are sold in the canteens. The quality is good. In the artillery company, the consumption is scarcely one dram for each man per diem. In the infantry, during the last six months, it has amounted to two gallons eighteen drams per each man. The use of spirits is optional, and no dram is issued before morning parade. Two drams are allowed daily in the barracks and in the field. Spirits are not issued to convalescents. There are no injurious drinks other than intoxicating drinks, sold in the canteen or bazaar. 4. The consumption of spirits is injurious, if more than one dram be taken daily. It is not conducive to the internal discipline and efficiency of the corps. 5. Spirits are not given as part of the ration. Its use is entirely optional, and some men seldom or never touch it. A second dram should never be allowed in barracks, and the use of spirits should be abolished. 6. Malt liquor is essential to preserve the troops in health and vigour, but spirits are not necessary for this purpose. Of the use of wine, there is no experience. 7. Coffee, tea, lemonade, &c., are much used as drinks. Their influence is beneficial, but one material disadvantage attends the use of these drinks, as well as of spirits and malt liquor, namely, that of drawing the men into crowds in a confined space, for two or three hours in the evening, often the most oppressive part of the day, and that in which apoplexy is especially liable to occur. 8. It would be beneficial to suppress the use of spirits altogether, and to substitute beer, tea, coffee, &c. 9. It would be beneficial to prohibit the sale of spirituous liquors in the canteens and to permit only beer, tea, coffee, &c., to be sold.

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References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	10. In regard to recommendations; if the spirit ration be allowed, it should be issued only once a day. Canteens are usually thrown open two or three hours before tattoo every evening, and, unless the accommodation is very capacious indeed, the result is over-crowding to a great extent, and fever, apoplexy, and a general increased prevalence of disease, endemic or epidemic, is the sure consequence. Moreover, as it is found practically impossible to limit the consumption of each man to the quantity of liquor he is entitled to draw, or to ascertain that he drinks the liquor he procures, it is obvious that if spirits be issued at night, drunkenness must be in many cases the necessary result. 11. As regards canteen and bazaar regulations, the orders laid down in Jameson's code and appendices are carried out at the station.
VI. DIET.	1. The ration for European troops consists of 1 lb. bread, 1 lb. meat (mutton twice a week), 1 lb. vegetables, 4 oz. rice, $\frac{4}{7}$ oz. tea (one-third green, two-thirds black), $2\frac{1}{2}$ oz. sugar, 1 oz. salt. Last autumn it was found necessary to substitute 4 oz. dhol twice a week for 4 oz. of rice, in order to add variety to the vegetable elements of the soldiers' diet, and to make up the amount of nitrogen deficient in the meat of the season. The rations are inspected by the orderly officer. 2. There is a complete ration given, but the meat is indifferent from April to the end of August. The soldier has three meals a day; breakfast, at 8 a.m.; dinner, at 1 p.m.; supper, at 5 p.m.; a portion of the meat is grilled, curried, &c., for breakfast. The remainder is cooked for dinner. The stoppage amounts to fivepence per diem. 3. The ration is susceptible of improvement. Meat of improved quality is required in the summer and autumn months, and during the latter vegetables of a proper description (which are sometimes wanting) are desirable. The rations are inspected at meal times by the orderly officers. 4. There are cookhouses well ventilated through the roofs, each having a structure of masonry extending along the centre of the room, and provided on each side with numerous cells for cooking utensils, the latter being of copper, and tinned inside twice a month, or oftener when deemed necessary. There is one master cook and 4 or 5 assistant cooks for each company. Most of them are Portuguese. Their cooking is good, and the dishes embrace curries, stews, grills, puddings and pies, &c. in great variety, and according to the taste of the men themselves. Tea and coffee are well prepared. The men have coffee on the march. 5. Soldiers' gardens for the cultivation of vegetables could be advantageously established near the station. The land assigned for this purpose should be allotted by companies; a free supply of water and tools should be available. The assistance of native labour should be provided in all the rougher operations, and sheds built to shelter the men at times from the sun and rain. Prizes might be offered with advantage for the best show of vegetables, and an equivalent for the amount of vegetables supplied might be deducted from the daily stoppage, to enable the soldier to purchase for himself eggs, butter, milk, &c.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. In the European infantry each soldier has one forage cap, one wicker helmet with turban, six cotton shirts, two flannel shirts, or two belts, two pairs of woollen socks, four pairs of cotton socks, cloth tunic, serge tunic, cloth and serge trousers, two coats and two pairs of trousers of khakee, three pairs of boots, and one great coat. The European artillery are equally well provided. The present dress is suitable for the climate and duties. The wicker helmet with turban, the serge frock, and trousers supply deficiencies which formerly existed; but the khakee coat is too thin to protect the spinal column from the excessive heat of the sun, and should have two folds of the cloth in the back. Waterproof capes and English boots should be available for men exposed to the wet during the monsoon months, whether in the plains or in the hills. The guard dress is determined by season. Serge coats and trousers are now generally worn during the rains, and great coats when necessary. Khakee clothing is worn in the hot dry months, and warm clothing in the cold season.
Duties.	1. It would be advisable as regards health that the men should be thoroughly drilled before being sent to India. 2. In the infantry the usual duties consist of morning and evening parades, one hour after sunrise and one hour before sunset. The artillery are generally occupied in the morning for $2\frac{1}{2}$ hours on parade and stable duties, and in the evening for one hour at stables. The guards night and day are light and the duties in no way injurious to health. The infantry have from 7 to 10 and the artillery from 4 to 5 successive nights in bed. 3. The most distant guard is not more than one mile from the barracks. The day guards last for 24 hours, and each sentry is on duty four hours by day and four by night at two different periods of two hours each. There are roll calls at meals, at morning and evening parades, and at tattoo. The night guards are light and not manifestly injurious to health.
VIII. INSTRUCTION AND RECREATION.	1. The means of instruction and recreation consist of ball court, schools, libraries, work-shops, soldiers' gardens. The last two are not kept up, however. There are no skittle grounds, day rooms, or soldiers' clubs, theatre, or gymnasia. Were all these provided perhaps it would tend to give occupation. At present not. The men are not allowed to leave their barracks during the heat of the day from the beginning of April to the commencement of the rains. The results, all things considered, are doubtful. There are advantages and disadvantages. 2. It would be advisable, by way of improving the means of recreation, to make up the deficiencies in the above list. Sheds should be constructed to protect the troops in the skittle grounds and gymnasium. A day room, provided with refreshments, would prove most useful, and divert the men from the canteen, about which they are so much addicted to crowd in the evenings. 3. The institution of soldiers' savings' banks is advantageous. 4. There is not sufficient shade from trees, sheds, verandahs, &c., for men taking exercise.

References to Subjects and Queries.	Replies.
IX. Military Prisons.	1. The solitary prison cells are ranged in two lines within a square, surrounded by a wall about 10 feet high. These buildings stand upon elevated foundations, are lofty, and are ventilated by iron bars in the doors, and by holes in the walls near the roofs. They have proved (and it is a fact worth noting) remarkably healthy, though quite unprotected from the sun and hot winds.
X. Field Service.	1. There are no local regulations for field service. 2. Camping grounds for troops on the line of march are laid down on ordinary occasions in "routes," furnished by the quartermaster-general's department; and representations from medical officers with regard to pitching the camps, halting, changing ground, &c., would, except in cases of military emergency, receive due consideration. 3. The senior medical officer is *ex officio* sanitary officer of the station, and his recommendations as to encamping any portion of the troops, as well as his sanitary suggestions generally, have hitherto been, as far as practicable, attended to. 4. No reply.
XI. Statistics of Sickness and Mortality.	1. The following form gives the statistics of sickness and mortality:—

Deesa.—European Troops.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1850-51	H. M.'s 8th Regiment - - Do. 86th do. - - -	998	522	4	—	—	81	2	84	1	258	8	10	1	9	2	706	5	1,670	23	167·3	2·3
1851-52	Do. 8th do. - - -	1,001	498	4	—	—	82	3	144	2	232	3	25	1	—	—	721	4	1,702	17	170·0	1·6
1852-53	Do. 8th do. - - -	984	487	7	1	—	93	1	103	2	160	6	29	2	—	—	632	3	1,505	21	152·9	2·1
1853-54	Do. 83rd do. - - -	33	16	—	6	—	9	1	1	—	6	—	3	—	—	—	28	—	69	1	209·0	3·0
1854-55	Do. 83rd do. - - -	340	185	—	1	—	116	1	36	—	84	—	23	2	—	—	355	—	800	3	235·2	0·8
1855-56	Do. 83rd do. - - -	475	291	1	3	—	42	—	18	—	31	2	28	2	—	—	282	2	695	7	146·3	1·4
1856-57	Do. 83rd do. - - -	822	460	—	—	—	50	3	40	1	63	3	24	4	2	2	624	3	1,263	16	153·6	1·9
1857-58	11th Company Royal Engineers H. M.'s 83rd Regiment - - Do. 89th do. - - - Do. 95th do. - - -	686	252	1	1	1	48	2	13	—	116	1	13	2	1	—	438	1	882	8	128·5	1·1
1858-59	Do. 33rd do. - - - Do. 89th do. - - -	619	474	3	3	—	70	1	19	1	90	2	21	5	—	—	461	—	1,138	12	183·8	1·9
1859-60	Do. 33rd do. - - - Depôt H. M.'s 83rd Regiment -	878	945	14	1	—	70	—	95	4	252	4	38	5	5	4	684	—	2,000	31	238·0	3·5
	European Troops in the Indian Army.																					
1850-51	1st Troop Horse Brigade - - 4th do. do. - -	108	45	1	—	—	12	—	4	—	25	1	13	—	3	3	129	—	231	5	213·8	4·6
1851-52	4th do. do. - - -	109	57	2	—	—	5	—	6	—	22	1	13	—	—	—	151	—	254	3	233·0	2·7
1852-53	4th do. do. - - -	109	179	1	—	—	7	1	3	—	23	2	8	—	—	—	116	1	341	5	312·8	4·5
1853-54	4th do. do. - - -	101	64	—	2	1	6	—	8	—	21	—	7	1	—	—	129	—	237	2	234·6	2·0
1854-55	2nd do. do. - - 4th do. do. - -	107	80	—	1	—	14	—	11	—	71	4	10	—	—	—	142	—	329	4	307·4	3·7
1855-56	2nd do. do. - -	99	43	—	—	—	9	—	5	—	47	—	9	—	—	—	149	—	262	—	264·6	—
1856-57	2nd do. do. - -	91	54	—	—	—	2	—	5	1	17	1	3	—	1	—	91	—	173	2	190·1	2·1
1857-58	2nd do. do. - - 1st Company 2nd Battalion Artillery - - -	17	18	—	—	—	—	—	3	—	6	—	1	—	—	—	25	—	53	—	311·7	—
1859-60	1st Troop Horse Brigade - -	121	103	—	—	—	25	—	17	—	60	—	13	1	—	—	351	—	569	1	470·2	0·8

Native Troops.

1850-51	Left Wing 2nd Regiment Light Cavalry - - - - 10th Regiment Native Infantry -	1,045	227	1	13	—	11	—	2	—	89	3	17	—	2	2	537	2	898	8	85·9	0·7
1851-52	Detachment 2nd Regiment Light Cavalry - - - - 10th Regiment Native Infantry -	1,056	291	2	3	—	25	3	2	1	96	1	20	—	—	—	404	1	841	8	79·6	0·7
1852-53	Detachment 2nd Regiment Light Cavalry - - - - 10th Regiment Native Infantry -	923	488	3	4	—	22	—	1	—	58	—	12	1	—	—	388	—	973	4	105·4	0·4
1853-54	Squadron 2nd Regiment Light Cavalry - - - - 10th Regiment Native Infantry - 23rd do. do. - -	1,066	325	3	8	1	28	—	1	—	87	3	8	1	—	—	596	3	963	11	90·3	1·0
1854-55	Squadron 2nd Regiment Light Cavalry - - - - Do. 3rd do. - - Left Wing 23rd Regiment Native Infantry - - - -	757	194	2	1	—	5	—	2	1	48	2	15	1	—	—	236	3	501	9	66·1	1·1
1855-56	Squadron 3rd Regiment Light Cavalry - - - - 12th Regiment Native Infantry - 23rd do. do. - -	744	223	7	—	—	25	3	2	—	53	2	8	—	—	—	325	—	636	12	85·3	1·6
1856-57	Squadron 3rd Regiment Light Cavalry - - - - 12th Regiment Native Infantry -	840	143	2	5	—	26	1	1	—	34	1	3	1	—	—	317	2	529	7	62·9	0·8
1857-58	Squadron 2nd Regiment Light Cavalry - - - - Wing 17th Regiment Native Infantry - - - -	667	150	—	17	1	11	—	2	—	30	1	9	—	—	—	362	—	581	2	87·1	0·2
1858-59	Squadron 2nd Regiment Light Cavalry - - - - 17th Regiment Native Infantry 31st do. do. -	782	367	12	8	—	20	1	—	—	89	2	5	—	1	—	406	4	896	19	114·5	2·4
1859-60	3rd Company 3rd Battalion Artillery - - - - Squadron 1st Regiment Light Cavalry - - - - 31st Regiment Native Infantry -	680	345	3	—	—	33	1	4	—	64	1	11	1	—	—	460	—	917	6	134·8	0·8

DEESA.
BOMBAY.

WOMEN and CHILDREN.

Years.	CORPS.	Women. Strength. European.	Indo-European and Native.	Total.	Treated. European.	Indo-European and Native.	Died. European.	Indo-European and Native.	Ratio per Cent. to Strength. Treated.	Died.	Children. Strength. European.	Indo-European and Native.	Total.	Treated. European.	Indo-European and Native.	Died. European.	Indo-European and Native.	Ratio per Cent. to Strength. Treated.	Died.
1852-53	H. M.'s 8th Regiment	92	2	94	82	2	5	—	89·3	5·3	174	7	181	85	2	6	1	48·0	3·3
1853-54	Do. 83rd do. -	51	—	51	65	—	2	—	127·4	3·9	77	—	77	57	—	1	—	74·0	1·2
1854-55	Do. 83rd do. -	29	—	29	32	—	1	—	110·3	3·4	51	—	51	16	—	—	—	31·3	—
1855-56	Do. 83rd do. -	92	—	92	88	—	2	—	95·6	2·1	155	—	155	125	—	9	—	80·6	5·8
1856-57	Do. 83rd do. -	92	—	92	—	—	—	—	—	—	156	—	156	151	—	19	—	96·6	12·1
1857-58	Do. 89th do. -	11	—	11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1858-59	Do. 33rd do. -	40	1	41	52	2	1	1	131·7	4·8	67	1	68	53	—	1	—	77·8	1·4
1859-60	Do. 33rd do. -	54	—	54	88	—	1	—	162·9	1·8	90	—	90	110	—	14	—	122·2	15·5
1852-53	4th Troop Horse Brigade - -	9	7	16	7	4	1	—	68·7	6·2	14	15	29	8	1	1	1	31·0	6·8
1853-54	4th do. - -	7	6	13	18	4	—	—	169·2	—	14	15	29	18	11	2	1	100·0	10·3
1854-55	2nd do. - -	7	5	12	—	1	—	—	8·3	—	7	12	19	—	—	—	—	—	—
1855-56	2nd do. - -	6	4	10	6	6	—	1	120·0	10·0	9	6	15	14	10	—	3	160·0	20·0
1856-57	2nd do. - -	5	3	8	6	6	—	—	150·0	—	10	6	16	8	2	—	—	62·5	—
1859-60	1st do. - -	11	1	12	9	10	1	—	158·3	8·3	11		12	2	1	1	—	25·0	8·3

By order of the Principal Inspector-General, Medical Department,
W. C. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General Medical Department,
Bombay, 22nd December 1860.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. Plans, &c., of hospital.

2. The European regimental hospital is about 1,600 feet north-east of the barracks, and immediately in rear of the officers' lines. The troop hospital is 1,400 feet north-east of the horse artillery barracks, and also in rear of the officers' lines. The bazaar occupies the S.W. extremity of the cantonment. The site of the European hospital is the highest and best in the cantonment. The officers' lines are too close, and obstruct the breeze. The artillery hospital is on lower ground, and at a similar disadvantage as regards the breeze. There are no nuisances, malaria, &c., in the vicinity.
3. The water supply is abundant and wholesome.
4. The drainage is similar to that described for the barracks.
5. The ward floors are raised about 1½ feet above the ground. No ventilation underneath.
The roof water sinks into the subsoil. There is no surface drainage or guttering round the hospitals.
The hospitals are built of similar materials to the barracks. The walls are single. No complaint has been made as to heat from the roofs; were the walls higher, however, it would tend to coolness. There are verandahs 10 feet wide all round, sufficient to afford shelter from the sun's rays. The front or closed verandah of the British infantry hospital has, under circumstances of great pressure, been partially occupied, but platforms were erected on the recommendation of the medical officer, on which tents are constantly pitched for the accommodation of convalescents. The hospitals consist of one floor. They were constructed in 1827-28, and contain 12 wards and 505 beds.
The following table gives the details of the accommodation:—

Wards.	Regulation Number of Sick per Ward.	Dimensions of Ward. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Feet per Bed.	Height of Beds above Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft.	Feet.			Ft. In.		Feet.	Feet.
No. 1 - -	6	25	25	17⅓	10,937½	1,822 9/10	104 2/10	1 7	—	—	—
No. 2 - -	12	55	25	17⅓	24,062½	2,005⅓	114⅓	1 7	4	6¼	3½
No. 3 - -	12	55	25	17⅓	24,064⅓	2,005⅓	114⅓	1 7	6	6¼	3½
No. 4 - -	12	55	25	17⅓	24,062½	2,005⅓	114⅓	1 7	6	6¼	3½
No. 5 - -	12	55	25	17⅓	24,062½	2,005⅓	114⅓	1 7	4	6¼	3½
No. 6 - -	6	25	25	17½	10,937½	1,822 9/10	104 2/10	1 7	0	—	—
Female wards 7 - -	4	18	18	16	5,184	1,296	81	1 7	2	6¼	3½
Female wards 8 - -	4	18	18	16	5,184	1,296	81	1 7	1	6¼	3½
Female wards 9 - -	8	30	18	16	8,640	1,080	67½	1 7	6	6¼	3½
Horse Artillery.											
No. 1 - -	16	75½	23	22	38,203	2,387 6/10	108½	1 7	12	5¾	3¾
No. 2 - -	7	20	23	22	10,120	1,445 7/10	65 7/10	1 7	4	5¾	3¾
Female ward 3 - -	6	20	19	17¼	6,555	1,092½	63⅛	1 7	4	5¾	3¾

The hospitals are not so placed as to receive the full benefit of prevailing winds. The windows open outwards; they are of Venetian construction.
6. The hospitals are ventilated by ventilators in the roof, punkahs, doors and windows. The ventilation is generally sufficient, but not superior to that obtained by better construction.
7. Punkahs are used for cooling the air.
8. No means of warming are required.
Limewashing of wards is used whenever required; there is no stated interval for doing this.
9. The privies are detached from the hospital, and are adjacent to cesspits similar to those of the barracks.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	10. In the artillery hospital, the lavatory arrangements are insufficient. In the infantry hospital, they consist of sheds projected from the rear verandah, fitted up with tables, basins, chatties and towels. The water supply is abundant, and the arrangements are sufficient, but not satisfactory, as the sheds interfere with the ventilation of the wards. 11. The means of bathing consist of chatties, tin baths, and basins, not sufficient nor convenient. 12. Native washermen employed by the month take away the hospital linen, and wash it at the river side, or at rain water pools. 13. The hospital storage is sufficient and dry. 14. The hospital bedsteads are made of iron, bottomed with iron plates or strong cotton tape, and are excellent. The bedding consists of counterpanes, blankets, sheets, mattresses, stuffed with rice straw, or cotton; but hair or cocoa-nut fibre would be preferable materials. 15. The means of cooking are like those described for the barracks,—cells in masonry, copper pans, pots, kettles, &c. The cooks are Portuguese or natives, and do their work tolerably well, varying the cooking as required, and acting under the superintendence of the hospital steward, and an orderly from the regiment. 16. Diet tables, &c., the same as in all other hospitals in the Presidency. 17. The attendance on the sick is ample and sufficient. In the European regiment it consists of an apothecary, steward, assistant apothecary, medical apprentices, compounder, matron, assistant matron, hospital serjeant, and the second class hospital servants, as detailed in the monthly returns of sick; orderlies from regiments being employed during epidemic disease, or in particular cases of importance. The artillery hospital is equally well provided for. 18. The sanitary condition of the hospitals is excellent. No epidemic has originated in the wards. No instance of pyæmia or hospital gangrene; ulcers and wounds heal rapidly. 19. All sanitary defects have been corrected on the representation of the medical officer; thus, ventilators have been constructed in the roofs of the privies; a dead wall in each of the wings forming the subsidiary buildings has been removed, and new ablution rooms have been constructed. But the hospital accommodation is too limited. Two small wards are required for cases of contagious disease, and for insane or drunken men, and one ward is required capable of accommodating 20 convalescents. 20. The hospitals stand in large spaces enclosed by hedges in which convalescents exercise morning and evening along walks shaded by trees. Horse exercise is allowed in the artillery when deemed necessary. 21. There is a separate hospital for women and children. The present arrangements in this respect are satisfactory. 22. There are no local hospital regulations. 23. Representations on all subjects connected with the hospital, sick, &c., have been made from time to time, as occasion required, and they have invariably received prompt attention. 24. There are no convalescent wards or hospital, but as the hospitals are too small, accommodation for convalescents, both artillery and European infantry, is necessary. It may be mentioned that the artillery hospital has no apothecary's quarters, no dead house, and no guard house, and that the men on guard occupy a corner of the front verandah of the hospital, where they eat, drink, and smoke at their discretion.
XIII. Burial of the Dead.	1. The British burial ground is inside the cantonment, and is well open to every breeze. 2. The area is about 2¼ acres. Soil, white earth; subsoil, red earth with limestone. Drainage, surface and rapidly sinking into the subsoil. 3. Grave space 3 feet wide; same distance between the graves. In ordinary cases the depth of graves is 6 feet. During epidemics it is 7 to 8 feet. Graves have never been re-opened in late experience, and the re-opening of them is only admissible for the remains of relatives of parties previously interred. Burial takes place within 24 hours after death at ordinary times. During epidemics, 16 hours after death, or 12 hours after, if practicable. 4. No graveyard is now offensive. When a soldier dies, a casualty report is forwarded by the medical officer to the officer commanding and the chaplain, in which the hour for burial is named. At that time the deceased is removed in a hearse (closed), and accompanied to the graveyard by his company and former friends. 5. The Mussulmans bury their dead in an appointed spot on the western extremity of the bazaar, near the bank of the river. The Hindoos burn their dead near the bed of the river, and the ashes being afterwards collected, are thrown into the water and washed away. 6, 7. No injury to the public health from the present practice of burial, and no improvements to suggest.

(Signed) T. Williams, Brigadier,
Commanding Deesa Field Brigade.
W. Hanbury, Surgeon, H.M. 33rd Regiment.
John R. Maunsell, Captain Engineers,
Executive Engineer, Deesa and Aboo.

Deesa, 4th September 1860.

ASSEERGHUR.
BOMBAY.

ASSEERGHUR.

Accommodation { Queen's Troops—Infantry { H.M. 95th Regiment. The new barracks will hold 100 men when finished.
Native Troops—Infantry. Nine pendalls, about 50 men each.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The general aspect of the country surrounding the station is wild, and cut up by ravines. To the west, and at a greater distance to the S. and S.E., it is mountainous; the rest is hilly. The surface is generally dry, but water lies for many months in the ravines. The station is in the centre of a belt of jungle, 20 miles in breadth. 2. The station is about 800 feet above the level of the sea. The nearest water is in the tanks of the fortress, which are kept filled. The river Taptee flows past at about 8 miles' distance. There is no higher or healthier ground adjoining the station. 3. The nearest hills are about 3 miles from the fortress; their summits are, however lower than the station. 4. There is no liability of the water overflowing in the vicinity. There is much broken ground, but this has no effect upon the health of the troops. 5. The station is very open, and much exposed to winds. The temperature of the station is raised by the reflected sun-heat from the rock formation universally prevalent in the fort. The winds are very variable; both the east and west winds being violent, the latter most prevalent. 6. Very little of the surrounding country is cultivated within a radius of 6 miles. There are no works of irrigation near the station. Neither rice, indigo, hemp, or flax are cultivated near the station. 7. Burhampore is at a distance of 13 miles. 8. The geological structure of the district consists chiefly of trap rock; there is very little soil, the surface is morum. The station does not occupy new ground. 9. From the nature of the surface, water cannot be dug for. There are many rocky caverns winding through the village, as well as in the station; these are nearly dry in the hot season, but are full of water in the rains. 10. The rain-fall partly flows away into the principal nullahs, and the remainder evaporates in pools. There is no adjacent higher ground the drainage from which passes into the sub-soil of the station. 11. The water supply of the station is derived from tanks and rain-fall; these tanks being open, and generally well filled. The tank surface is 163,000 square feet in the fort, and about 7,000 square feet in the lower fort and village. The tanks contain *datura stramonium*, *hyoscyamus niger*, the nim tree, or *melia azadirachta*, a valuable febrifuge, &c., &c.; and all along the banks of the Taptee and close to the station may be found every kind of game, a large species of antelope, the *tigris felis*, the bear, the somber, the bison, &c. One tank is used for drinking and bathing; for the former the natives slightly clear away the surface. The water near the N. I. pendalls "15 to 20," emits effluvium during the rains; if the tanks were drained and the water cleared out this might be prevented. From the amount of minute vegetable matter in the open tanks, malaria must emanate, especially before the rains; yet this is a healthy station, and generally free from fever. 12. The water supply is sufficient for 3,500 inhabitants, inclusive of the water in the fort. There are not sufficient means at the station for analyzing the water; it is moderately hard; there is no microscope. The water in the sweet well reserved for Europeans is good, but that in the tanks is very bad, though not considered so by the natives when filtered, and the tanks are preserved for the use of the garrison, and used only for drinking. The water is raised and distributed by the mussacks of water carriers. There is no better supply to be had. Probably the supply of good water might be increased by making fresh wells in the rock. 13. The ruined walls of old native edifices might be pulled down, as they only serve as screens for an accumulation of native filth. 14. New stations should be selected by engineers and medical officers; elevated ground, with geological facilities for drainage and the formation of wells and tanks, and the cultivation of gardens should be selected; and all jungle should be destroyed within a circumference of half a mile on all sides of any new station.
II. CLIMATE.	1. The only instruments at the station for conducting or registering meteorological observations are a thermometer, pluviometer, and a rain gauge. 2. No observations or meteorological tables have been kept. 3. The climate is excellent, moderately dry, and not very variable; it is not affected by tree planting or canal irrigation. It has an excellent influence on the health of the troops, who require in this station no diet, shelter, or clothing beyond that which they receive at other stations in India. The precautions to be used with respect to drill, duties, &c. are the same which common sense dictates, and is practised in other parts of the country. The first quarter of the year is the most healthy season, and the third quarter the most unhealthy, although the difference is hardly appreciable; fever of a remittent type is prevalent in the third quarter. 4. There is no other district adjacent to the station which would offer a superior position, or be more conducive to health. 5. Assistant-Surgeon Irwin, of H.M. 28th regiment of Foot, has served in Bombay, Nussick, and Asseerghur; the first he considers quite unfit for the British soldier; the second, a much healthier station, but much visited by epidemics of cholera; the third, salubrious and conducive to health. Col. H. James, commanding Asseerghur, states, he was attached and did duty with the 1st battalion of 10th N. I. at Poona, from April to September 1821; in October he joined the 2nd battalion 9th regiment N. I. at Severndroog,

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	and followed the fortunes of that regiment (which, on the reorganization of the army on the 1st May 1824, became the 18th regiment N. I.) until February 1845; it was then at Sinde, when he left on medical certificate for England, and rejoined his regiment in 1847, and commanded it for 8 consecutive years until December 1855, when he was sent home from Aden on medical certificate. He served at most stations in the Bombay Presidency. The men were at all times healthy, except when attacked with cholera *en route* from Kulladgee to Belgaum in 1837; the regiment went to Baroda, and remained six years, during which time it was very healthy. At Aden the men suffered from scurvy the first year (1855-6); 14 officers were on sick certificate in England; 8 officers and 2 medical men left it for Aden. Sinde and Aden are the only 2 insalubrious stations; none are positively injurious.
III. Sanitary Condition of Station.	1 to 4. Plans of the station and surrounding country are transmitted. Very few drains. All refuse is thrown over the fort wall. The barracks are in course of construction for 100 men. The detachment of H.M. regiment since their arrival have occupied a fine old mosque, which will accommodate about 50 men; at present it is very crowded, with 73 men; the remainder of the detachment (20) reside in a house formerly the staff-serjeants' quarters, which is in a dilapidated state. Had the one barrack been completed, with its conveniences, the cost of which would have been about 300 rupees, the Europeans would have been supplied with splendid quarters. The right half barrack is finished, with the exception of the glass, and will accommodate about 50 men when completed; but the work of all public buildings is stopped by order of the Government. 5. The windows in the new barracks are on opposite and adjacent sides, all round the verandah; to these there are glass window shutters; and the walls of the main room are pierced with arches, without frames, and have walls built in them to the height of 4 feet. The verandah is carried round the building, and is 10 feet wide; it is not yet occupied. There are neither jalousies or jhilmils. 6, 7. There are no tents used in the garrison. 8. In the new barracks there is a ventilator, open on four sides, on the summit of the roof; all other ventilation is effected by having the walls of the sleeping apartments furnished with numerous arches which open into the verandah. The means of ventilation is decidedly sufficient to keep the air pure by night as well as by day. There are no other means adopted for the purpose of cooling the air. 9, 10. The new barracks are built chiefly of brick, partly of stone and lime. The floors are intended to be of stone; their surface will average 5 feet above the ground level; there is no passage of air beneath. 11. The walls of the barracks should be made of brick, 3 feet thick; the verandahs 4 yards in width; a double roof to the barracks, the outer roof being elevated 1 foot from the inner one, and of a smaller area; thus allowing a free current of air from below upwards, and *vice versâ*. It is the duty of the engineer officer, should he be at the station, or in his absence the fort adjutant, to keep the barracks and cantonments in repair. The work is performed by contract, and the medical officer is responsible for the general sanitary state of the cantonment. The walls and ceilings of the barracks are cleansed and lime-washed inside every 6 months; outside every 12. 12. A marginal sketch of the men's lavatories is appended to the plan transmitted. The water is supplied by hand, and drained into a cesspool near the building. 13. A marginal sketch of the cookhouses in the barracks is transmitted. The means of drainage is by removing the refuse water by hand from a reservoir outside. There are no conveniences for washing or drying linen. 14. A marginal sketch of the privies and urinals is attached and transmitted. 15. The only means of ventilation adopted for outbuildings is by the windows and doors being open; the former being upon vertical hinges in the usual way. The barracks are lighted by oil in earthen lamps. 16. The construction of sewers and drains has not been considered as yet in the new barracks; but the sewerage will be probably removed by hand. One of the tanks on the west side of the fort is unsavory at certain seasons of the year. No part of the buildings used as barracks or hospitals is in the least damp. The refuse is in all cases thrown over the fort wall. There are no foul ditches near the station. 17. There is one open space of ground near the main guard and parade ground, where all the native women of the station defæcate; this is cleaned by the mehter once a day, but the smell which arises is always offensive, and would nurture epidemic diseases, especially cholera, should it break out. The refuse, as is usual in all cases, is thrown over the fort wall. No case of cholera has as yet occurred, although it is prevalent in the Pettah below, and in the adjoining villages. 18. The surface of the cantonment is kept free from vegetation. The ruins of the old palace on the west side might with great advantage be pulled down and removed, as it only serves as a screen for filth, and would improve the health of the station. 19. The sanitary condition of the bazaar is satisfactory; it is well drained and ventilated, well supplied with water, and kept clean. The sweepers carry away all the dirt, dry leaves, &c. collected. A policeman ought to be entertained to enforce the regulations in the fortress bazaar. The native houses near the station are built in all shapes and of all sizes in the Pettah, and are irregular, like all old villages; there are neither dungheaps or cesspools within them; but no nuisance is experienced from them at the barracks. 20. Bullocks are slaughtered in the Pettah, about a mile below the fort; one sheep occasionally slaughtered in the fortress for the use of the European residents. No nuisance is experienced in the station from the condition of the slaughter-houses. 21. There are no arrangements for the stabling or picketing of bazaar horses, or those of camp followers. 22, 23. There are neither picketing grounds or stables for the artillery or cavalry horses at the station. There is no accommodation whatever for married non-commissioned officers or men; and there were two of H.M. 28th regiment who occupied barrack rooms with the men, and one of H.M. 95th regiment who does so now.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is good and airy; being on a slope, the rain runs off immediately. All houses should be tiled; all grass roofs positively prohibited.

ASSEERGHUR. BOMBAY.

References to Subjects and Queries.	Replies.
IV. HEALTH OF TROOPS.	1 to 3. The surrounding district and native population are essentially unhealthy. Cholera and fever are prevalent. This may be attributed to the excessive filthiness of the habits of the native population, and the total absence of all sanitary enforcement.
	4. H. M. 28th detachment were at Bombay previous to arriving at this station, at which they remained 1 year, leaving that place on December 10th, 1859. They suffered from fever and dysentery, and arrived January 10th, 1860. Their health was good on arrival at this station. They have chiefly suffered from fever since.
	5. The troops are not camped out.
	6, 7, 8. Hill stations always to be preferred; they are more healthy for the troops.
	9 to 11. Not aware of any diseases peculiar to hill stations which the troops are liable to be attacked with on going to them. The hot seasons are best adapted for residence in hill stations. The shortest period of residence to enable troops to receive the full benefit of the hill stations would be 4 months.
	12. No injury to the troops by a longer residence.
	13. There are no special precautions required for the protection of the health of the troops on leaving hill stations for the plains.
	14. Hill stations are the best for the troops, their periods of service on the plains being brief and well-timed as to season, &c. Frequent change of station would be beneficial, respective of season.
	15. The barrack and hospital accommodation is sufficient for the troops at hill stations I have had experience of.
	16, 17. There is no higher ground near the station which could be advantageously occupied as a hill station.
	18, 19. The British soldier should land in India under 22 years of age, and during the months November, December, and January. Precautions should be taken to clothe them suitably upon landing, giving them abundance of vegetable diet, prohibiting dram drinking almost to interdiction, and promoting healthy and interesting exercise.
	20. Troops should be sent direct from the home depôts to India. If they land in the hot weather they should be gradually acclimatised by a preliminary residence in hill stations.
	21, 22. A British soldier should not serve more than 5 years at a time in India.
	23, 24. Invalids should leave India for home during the cold season.
Diseases.	1. There is a regular weekly inspection parade for the discovery of incipient diseases.
	2. There has been a tendency to the development of scorbutus in H. M. 28th detachment, owing to deficiency of the vegetable element and the rations; this might be remedied by allowing the men to cultivate gardens.
	3. The proportion of cases of hepatic disease is about 4 per cent. It is attributable to the climate, and may be considered as a primary affection; not aware of any prophylactic measures.
	4. No case of dracunculus has occurred at the station.
	5. Cases of venereal disease are few and far between.
	6. The troops at this station suffer from endemic diseases, such as remittent, intermittent, and common fevers, acute and chronic dysentery, and acute rheumatism. No case of cholera or small pox has occurred; neither has there been a death.
	7. Zymotic diseases have been so rare that no distinct axiom can be drawn as to their general nosological character.
	8. The prevalence and extent of epidemic disease in this country is influenced considerably by the absence of healthy occupation for both mind and body, as also by the long and tedious marches which the troops are subjected to.
	9. Small doses of quinine have not been administered at the station as a prophylactic against malarial diseases.
	10. Thorough and efficient surface cleansing of the station and its vicinity, good drainage, the occasional cleansing of tanks from superabundance of vegetable matter, and the strictest attention (and this is often disregarded) to avoiding overcrowding the men in barracks would be the best means of preventing or mitigating epidemic disease at the station.
V. INTEMPERANCE.	1. The soldiers at this station are generally temperate; there are only between two or three confirmed drunkards.
	2. The proportion of admissions into hospitals caused by diseases the direct result of intemperance is 1 per cent.; there are none caused indirectly. Having arrived only four months since at the station there are no statistics prepared of the amount of sickness, mortality, or crime at the station caused by intemperance, total abstinence, or temperance; besides the number of men is only 79 Europeans. Drunkenness is punished as an offence.
	3. Distilled spirits are sold in the bazaar, but European soldiers are not allowed to buy them. The quality is: arrack, $\frac{19}{25}$ths; water, $\frac{6}{25}$ths. Spirits form part of the soldier's rations at the station, on the march, and in the field. No spirits are issued on the march before sunset; one dram is allowed in the morning before breakfast. This practice is not detrimental to their health in the cold season, but good strong hot coffee would be a good substitute in the hot season. One dram is given at the discretion of the medical officer.
	4. Malt liquor is decidedly preferable to spirits for troops and covalescents; spirits are not generally issued or allowed by the medical officer to convalescents. The consumption of spirits throughout India is not conducive to the efficiency and internal discipline of the corps; yet the 95th detachment here has not been materially affected by it.
	5. Decidedly agree in abolishing the issue of spirits, except on the march, substituting an equivalent of beer or porter for the dram.
	6. Malt liquors, to the extent of one quart per day, are decidedly beneficial to the soldier in the habit of drinking fermented liquors, and are far superior to spirituous liquors in conserving health.
	7. No coffee is issued at the station; tea is used in moderation; ginger beer is the only effervescing drink used, and that very moderately. Their use is much more conducive to health, efficiency, and discipline than the use of spirits, or excessive consumption of malt liquors.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	8. It would be most decidedly beneficial to the health of the troops on the station if the spirit ration was abolished. Let beer and coffee be substituted. 9. It would be emphatically beneficial to prohibit the sale of spirituous liquors in the canteens to the troops. 10. No further recommendations on these points.
VI. Diet.	1. The ration for Queen's British troops and European troops in the Indian army is exactly the same, consisting of:—1 lb. bread, 1 lb. beef or mutton, 1 lb. mixed vegetables, 4 oz. rice, 1 oz. salt, $\frac{5}{7}$ oz. tea (mixed), $2\frac{1}{2}$ oz. sugar. The ration is inspected by the officer of the day, and the quarter-master sergeant. 2. A complete ration is provided; stoppage 1 rupee 4 pice per month; 3 meals per diem. One pound of mixed vegetables enters into the constitution of the ration. 3. It would be a considerable improvement in the ration if 1 cup of coffee and a hard biscuit were given to each man in the early part of the morning, before parade; the men having to rise very early in tropical climates, and at present have to go through fatiguing drills, &c. on an empty stomach, having to wait until 8 p.m. for breakfast. 4. The rations are cooked on an open fire-place by native cooks. The kitchens are at present dirty, and not well ventilated. They are, however, undergoing alterations, and will be white-washed when finished. They are well supplied with water. The food is roasted. The cooking is properly carried out, and tea and coffee properly prepared by the native cooks. When practicable the men on march have coffee issued to them after the first halt, 1 hour after leaving the old camp ground. 5. Gardens for the cultivation of vegetables by soldiers would have to be 3 miles away, each time descending and ascending the hill, the ground being also stony all around, and very little water obtainable 2 months after the monsoon.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress and accoutrements at this station consist of khakee clothing by day and large clothing by night, during the summer months, from 1st April to the middle of the monsoon in August. Cloth clothing is worn during the winter months or cold season, from September to April. The soldier's clothing is sufficient and suitable to the climate. The wearing of flannel next the skin should be enforced; the helmet should be made of wicker-work, and covered with pith 1 inch in thickness. The guard dress consists of khakee clothing, and the wicker-work helmet and cotton turban. English cloaks are the only protection from wet.
Duties.	1. Owing to the enervating, relaxing effects of the climate on Europeans, drill would be better and more readily learnt at home, and the figure better set up, than in India. 2. The usual routine is drill 1 hour after sunrise, which is beneficial to the men's health; it is the best time for drill. Marches should be performed so as to reach the new camp ground as soon as possible after sunrise. The men have on the average 4 or 5 nights in bed during the week. 3. Guards are mounted between 200 and 300 yards from barracks, and are relieved every morning. The roll is called after reveillée and before each meal. No additional precautions are requisite at this station for the performance of this duty.
VIII. Instruction and Recreation.	1. The means of recreation and instruction at this station consist of a ball-court, which is out of repair, a company library, and a theatre in a private house. There are no skittle-grounds, day-room, or soldiers' clubs, workshops, or gymnasia, consequently the men are not sufficiently occupied during the wet season or during the heat of the day. Restrictions are placed on the men as to exposure to the sun and rain when off duty, which, when carried out effectively, conduce to their health. 2. I would suggest the putting of the ball-court in working order, allowing fishing in the tanks, providing skittles and a skittle-ground, and encouraging quoits, leap-frog, &c. 3. Soldiers' savings' banks advantageous. 4. There is no shade from trees or sheds. In the new barracks, the verandahs are ample and well adapted for walking exercise.
IX. Military Prisons.	1. There is no military prison; the cells are good in a sanitary point of view.
X. Field Service.	No information under this head.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1, 2. The hospital is situated in the most elevated locality in the station, near the barracks. There are no stables. It is remote from the bazaar of the fort, which is very small. The civil houses are very few. The site is open and airy, and the ventilation is not obstructed by any buildings; the site of the hospital is in all respects healthy. 3. The water from 1 well only is good, but as this is reserved for Europeans only there is an abundance for them. Filtration of the water through charcoal and sand is a cheap and easy method of purifying it; and the practice should be instituted and enforced. 4. There is no drainage, but refuse matters and sewage are removed by the native sweepers. 5. The height of the lowest wards in the hospital above the ground is 4 yds. 1 ft. $9\frac{3}{4}$ in. There is no perflation of air beneath the floors. The roof water sinks into the subsoil. The hospitals being situated on elevated ground, the slope carries off the water rapidly and sufficiently. There are no drains or gutters around it. The hospital is built of brick, mud, and timber, and brick tiles. The roofs and walls are single but sufficiently thick to keep the hospital cool. There are verandahs on three sides, the length of which is 35 yds. 1 ft. 10 in., the breadth 2 yds. 2 ft. $\frac{1}{2}$ in., and the height 3 yds. 5 inches; these are used by sick patients during morning and evening, when able to take such exercise. The hospital

ASSEERGHUR.
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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	consists of only one flat. It is placed so as to receive the benefit of prevailing winds. The windows open in the centre, from above downwards, being divided into two lateral halves. Date of construction, 1859. Total number of wards, 6. Total regulation number of beds, 21.

Wards or Hospital Huts, No.	Regulation No. of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents				No.	Height.	Width.
		Ft. in.	Ft. in.	Ft. in.	Feet.			Ft. in.		Ft.	Ft. in.
General Ward -	8	47 $10\frac{3}{4}$	27 6	17 $6\frac{3}{4}$	21,573	2,696	Each bed covers a space of 14 feet.	—	14	$7\frac{1}{2}$	3 $9\frac{1}{2}$
Fever ditto - -	3	27 $5\frac{1}{2}$	12 $0\frac{3}{4}$	13 $9\frac{3}{4}$	4,214	1,404					
Opthalmic ditto -	4	27 $5\frac{1}{2}$	21 $4\frac{3}{4}$	17 $6\frac{3}{4}$	9,639	2,409					
Detained ditto -	3	27 $5\frac{1}{2}$	12 $0\frac{3}{4}$	13 $9\frac{3}{4}$	4,214	1,404					
Civil large ditto -	2	26 0	13 $7\frac{3}{4}$	17 $6\frac{3}{4}$	5,746	2,873					
Ditto small ditto -	1	13 $7\frac{3}{4}$	12 $2\frac{1}{4}$	13 $9\frac{3}{4}$	2,028	2,028					
Surgery - -	—	11 $4\frac{1}{2}$	11 0	13 $9\frac{3}{4}$	—	—					
Engineer's Measurement:											
Large General Ward	—	$48\frac{1}{4}$	26	18	22,581	1,129	63	$1\frac{1}{2}$	14	6	4
Opthalmic ditto -	—	27	$21\frac{1}{4}$	18	10,327	1,291	72				
Fever ditto - -	—	27	$11\frac{1}{6}$	12	3,618	1,206	100				
Scabies ditto - -	—	27	$11\frac{1}{6}$	12	3,618	724	60				
Strangers' ditto -	—	$25\frac{3}{4}$	$13\frac{3}{4}$	18	6,373	1,275	71				

6. The ventilation in use in the wards is by means of doors and windows, which are sufficient; no punkahs are used here. There are neither jalousies or jhilmils.
7. There are no means of cooling the air in the wards.
8. There is no necessity for warming the hospital wards. The walls and ceilings are cleansed and lime-washed twice a year interiorly, and once a year exteriorly.
9. There is 1 privy closely adjacent to the hospital; it is made of brick, and quite sufficient. There is no system of drainage; the mehter cleans them twice daily; they are not offensive.
10. There is 1 ample bath room for bathing and washing; this is sufficient for the requirements of the sick that the hospital can contain.
11. There is a large tub which is used for bathing by the sick, also a mussack bath, convenient and sufficient.
12. The washerman cleanses and dries the hospital linen, and performs this duty satisfactorily.
13. The storage is sufficient.
14. The bedsteads are constructed of iron with tapes (which are washed once a month) for supporting the mattresses.
15. The hospital kitchen is commodious, being adjacent to the hospital. The means and apparatus are abundant, tinned copper ghindies being the vessels employed the cooking of diets is properly done and sufficiently varied.
16. A copy of the diet table and diet roll is transmitted; all the other forms, &c. are those prescribed by the new hospital regulations for Queen's troops.
17. The attendance upon the sick is provided by a plentiful supply of ward coolies, dressers, &c., but a European soldier, when requiring it, can have the attendance of a comrade by permission of the medical officer. There is an acting hospital serjeant resident in the hospital.
18. During my experience (4 months) the sanitary condition of the hospital has been very good; no epidemic disease, hospital gangrene, or pyœmia have appeared in the wards.
19. There are no deficiencies or sanitary defects, excepting the very dirty and unwhitewashed condition of the hospital out-houses.
20. There is no special provision for the exercising of convalescents. The hospital dhoolie is occasionally used in the evening by convalescents. There are no shaded walks or seats for the sick. When able the sick take exercise in the hospital compound in the evening.
21. The soldiers' sick wives and children are treated in their own quarters; the present arrangement is sufficient as only 1 woman 1 child are present with the detachment.
22. There are no special local hospital regulations.
23. Practically speaking the medical officer has no power in matters connected with the sanitary state of his hospital, for although he may make suggestions he cannot enable them to be carried out with that energy and speed which the vital subject of preserving the health of the British troops demands. As regards diet, medical comforts, &c. at this station, his powers are ample.
24. There are no convalescent wards in the hospital. The number of British troops being so small (only 100 here) there is no necessity for them.

XIII. BURIAL OF THE DEAD.

1. The station is very limited and the burial ground is within the station and about 200 yards from the main guard. The prevailing winds, especially at night, blow from this ground over the main guard and native prison and the present barracks.
2. The area of the burial ground is 11,400 square feet, its soil is morum; and it is carefully kept.
3. The burial ground in the station is on the west side, but is not a nuisance. A space of 6 feet by 3 feet is allowed for each grave and an interval of about 3 feet between them. The graves are about 3 feet deep, and are never reopened excepting to erect a tomb of masonry. Only 1 corpse is buried in a grave. Interment takes place generally 24 hours after death, as the body decomposes quickly, at ordinary times; in cases of cholera immediately. There is no burial ground for native troops.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	4. I have not detected any offensiveness arising from the graveyard. 5. The dead belonging to camp followers and bazaar people are buried or burnt according to caste, outside the fortress. 6. I have not detected any injury to the public health arising from the practice. 7. I should suggest a burial ground being established below the fort, at a distance of half a mile from the pettah, since within such a very circumscribed space as the fort occcupies, a great accumulation of interred corpses must eventually tell on the health of the residents, especially in a tropical climate.

(Signed) H. James, Colonel, commanding Asseerghur.
John S. Allanby, M.D., Assistant Surgeon, H.M. 82nd Regt.

1st May 1861.

SHOLAPORE.

Accommodation.
- Queen's Troops—Artillery 75
- Native Troops
  - Artillery 75
  - Cavalry 411
  - Infantry 910

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is completely open and gently undulating; in some parts the undulations being very slight. The soil of the station is gravelly, with an underlying rock of sandstone; while that of the adjacent country consists of black, or what is termed cotton soil. There is no wood or jungle whatever, and the supply of water in the vicinity is very limited. 2, 3. The elevation of the station above the sea is 1,821 feet, but it is on much the same level as that of the adjacent country. The nearest water is a large tank, to the north of the artillery lines, the surface of which is 48 feet below barracks, and 44½ feet below the hospital floor level. Within 30 miles of this station there is no higher ground than the camp of Sholapore, and we are unable to state whether an extra elevation of 200 feet, which is obtainable at that distance, would be attended with any corresponding advantages to health and situation. The higher ground referred to is a tract of table land. 4. With the exception of a nullah which overflows its banks during the rainy season, and forms a marsh 3½ miles from camp to the north-east, the nearest water is the Seena river, which bends in such a form as to be within 13 miles of the camp to the east and eight to the south. The overflow from the nullah generally takes place in September and renders the road impassable for three or four days, but probably the adjacant country remains flooded for ten days or a fortnight. There is some slightly broken ground, some small ravines, and one or two water pits in the vicinity of the cantonment, but they have never been found injurious or in any perceptible manner to affect the health of the station. 5. The station is completely open and exposed to the prevailing winds, and none of the buildings exposed to reflected sun heat. The sea breeze is not felt at Sholapore, and the only wind which may be said to be disagreeable is that from the east. It is during the prevalence of this wind that fevers, ague, &c., usually occur. 6. The surrounding country is cultivated principally with dry crops, such as jowarree, bajree, grain, linseed, and cotton. There are no works of irrigation near the station, and no sensible effect has been found from the very slight artificial irrigation that is carried on in the vegetable gardens in the vicinity of the station. There is no ground suitable for rice cultivation within six miles of camp, at which distance there are only a few acres under cultivation. Indigo is not grown, nor is the preparation of hemp or flax carried on near the station. 7. The town of Sholapore, containing nearly 60,000 inhabitants, is within a mile of the station to the north. 8. The geological structure of the district consists of trap rock, generally speaking, covered by a bed of reddish kunkur, on which rests the regur or black cotton soil. There are also to the south, small ranges of low flat-topped hills, composed of laterite, remarkable as rising above the low trap formations amid which they are situated. We have no reason to believe that the ground which the station occupies has ever previously been occupied by population. 9. During the dry season the wells are dry, and water would not probably be met with in any quantity at a less depth than 80 feet below the surface, but during the rainy season water may be found at a depth of from 20 to 30 feet, varying in quantity according to the rainfall. 10. We believe that water from superficial springs flows readily away. A portion sinks into the pervious subsoil, and is so drained off; it does not ooze out after once being absorbed, and except in tanks, there is no spot where it can lie on the surface and evaporate. There is some slightly higher ground in the vicinity, but owing to the nature of the surface of the ground about the camp, the surface drainage is very effective. 11. The water supply is derived from wells fed for the most part by the percolation of the water stored in tanks on a higher level. Water for other than drinking purposes is stored in open tanks, and the surface of those within the station, when full, covers 152,736 square yards. Unless there is heavy rain in the months of April or May these tanks are liable to dry up, but it is five or six years since either of those at Sholapore were quite dry, still there is a great difference in the quantity of water stored immediately after the monsoon and the quantity in the tanks just before its commencement. Besides the grasses of different descriptions, and rushes, which line the banks of the tank to the north of the station adjoining the fort, the water contains flos aqua, and the infusoria which accompany them viz. the encapsuled amabæ, also oscillatoria and œdogonium. The water in the tank near the artillery lines may contain some organic matter, but it is free from plants, owing to its basin being of rock. Arrangements are made to guard against the water in any tank used for drinking purposes being also used for bathing, and these arrangements are, as far as practicable, enforced. The only well which would be liable to pollution from leaves or other matter falling into it, is protected by a roof, constructed of durable materials; and precau-

SHOLAPORE. BOMBAY.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	tions are taken to prevent any foul drainage or surface impurities draining into the tanks containing drinking water. If there should have been a scarcity of rain, and the water of the tank near the town fall so as to expose the ground and admit of the decomposition of the flos aqua, the houses on its bank have proved most unhealthy, and it is difficult to suggest means for preventing such nuisance. 12. The amount of really good water available for the station is limited, and in 1853 there was a scarcity of it. The drinking water is very good and soft. Its specific gravity, when filtered, is 1000·4, and the approximate number of grains of solid matter in a gallon is 30. It is altogether colourless; and with regard to its microscopical character, a bottle of water that was sent to Bombay to be tested was reported to contain nothing but a little shiny film of organic matter. It may, therefore, be inferred that it is very pure. The quality of the water is considered to be very good, and in no way injurious to health, but, as previously stated, the supply is limited. The water is raised from wells, generally speaking, by leathern vessels used by bheesties. It is not improbable that a better supply of water might, at a large expenditure, be obtained, but the means to be adopted for securing such must in a great measure be experimental. 13. We have no other topographical points to offer bearing on the health of the station. 14. It is, we believe, customary for the Government to decide who shall be appointed for the duty of selecting new stations. We think that considerable care is bestowed on the subject, and all possible means to guard against failure resorted to; still we are of opinion that it is a matter of very serious difficulty to decide whether a spot which is in every way found to be favourable for a native population should be equally so for the European constitution, and for this reason consider that in every case there should be a temporary before a permanent location.
II. CLIMATE.	1. The only instruments at present available for meteorological observations are the thermometer and pluviometer. 2. The following meteorological table is the result of 10 years' observations, from January 1850 to December 1860, as far as the instruments available have admitted of their being taken :—

Months.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain, Inches.	Winds.	
						Direction.	Force.
	°	°	°	°			
January -	74·5	10·2	79·6	69·4	·08	E.	Moderate.
February -	77·9	11·6	83·7	72·1	·46	Variable.	Calm.
March -	84·5	12·3	90·7	78·4	·333	W.	Gales.
April -	88·7	8·5	93·0	84·5	1·92	N.	
May -	87·9	10·8	93·3	82·6	2·273	N.W.	Stormy.
June -	83·3	8·5	87·6	79·1	3·680	W.	High winds.
July -	80·5	5·9	83·5	77·6	4·255	W.	do.
August -	80·2	6·6	83·5	76·9	6·223	W.	Moderate.
September -	80·5	7·6	84·3	76·7	6·770	W.	Monsoon.
October -	79·7	7·1	83·3	76·2	4·715	N.E.	Calm.
November -	77·1	7·5	80·9	73·4	1·411	N.E.	Calm.
December -	71·8	11·9	77·8	65·9	·496	N.E.	Calm.

3. The climate of Sholapore is warm and dry during the greater part of the year, the average temperature for the year being about 80°, and the lowest not under 65°, and the mean maximum 93°, thus showing a considerable range. The mercury obtains its highest elevation in the month of May, and its lowest in December. The greatest variability of temperature occurs in March, when the mean is 12° during the 24 hours, and the least variability is observed in October, the mean then being 7°; the mean daily range for the whole year being 9°. The greatest rain-fall has been 40 inches, and the least 13. Fogs occasionally occur during the months of February and March, towards evening. Tree-planting has been carried out to so small an extent that its effect can scarcely be appreciated. The atmosphere is pure, and during the greater part of the year highly rarefied. The high winds that prevail at certain seasons tend in a great degree to purify the air, and remove noxious vapours and effluvia; the absence of the conditions which are necessary to the production of malaria conduces also to this result. Hitherto the station has ranked high in the scale of localities at which European troops have retained their health; we are not aware that any particular kind of diet is necessary. Shelter, of course, should be of a superior description; but as regards clothing, we do not consider any change or addition requisite. The early morning and evening parades at the regulated hours, decreasing the amount of drill during the hot weather, are matters which have been duly considered, and the regulations in force under this head for the guidance of commanding officers are most judicious. The most healthy months are February, March, and April, and the most unhealthy are July, August, December, and January. The prevailing diseases during the months of July and August are intermittent fevers of the quotidian and tertian types, and diseases of the stomach and bowels (chiefly diarrhœa and dysentery). The prevailing diseases in the months of December and January are intermittent fever, congestion of the internal organs, and functional hepatic disorders.
4. We have no reliable data to base an opinion as to the advantages of any district near the station which might prove more conducive to health than that of the station.
5. The president, during a service of 41 years, has served at every military station in the Bombay Presidency, except Mhow and Deesa. He believes Baroda and Ahmedabad to be the most unhealthy, and Poona the most healthy. The senior medical member of the Committee, during a service of 28 years, has served at most of the stations of the Bombay army, and considers Ahmedabad and Baroda the most unhealthy, and Neemuch the most healthy station. The junior medical member has served longest at Deesa, Mhow, and Sholapore, and considers Deesa and Mhow decidedly the most healthy. The engineer officer has served at Poona, Belgaum, and Sholapore only, during a service of seven years. The stations above named stand high in the scale of salubrity.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station.	1, 2, 3. A map and plan of the station, with a ground plan of the barracks, are transmitted. 4. Table of Barrack Accommodation. Date of construction, 1830. Total number of rooms or huts { 3 barrack rooms, 1 used as harness room. Total regulation number of non-commissioned officers and men, 75 to 80.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet. In.	Feet.	Feet.	Feet.			Inches.		Feet. In.	Feet. In.
2 (no ceilings)	40	96 6	24	11	39,372	984·3	42·9	18	22	5 4	3· 8
Guard room -	9	29 10	16	11	5,350	594	53	18	3	3 6	4 6
Prison cells -	1	12 6	12¼	13¾	2,028	2,028	153	Are ventilated by means of air holes in the walls and by ventilators in the roof.			

5. The windows are ordinary plank shutters, three in number, two of which open horizontally for the lower half, and one vertically for the upper half. They are on opposite sides of the rooms. The barracks have a verandah on one side, but it is never used as sleeping quarters. There are no jalousies or jhilmils.
6. The bedsteads used in barracks are either planks on iron trestles or wholly of iron. In the tents, straw is served out. The bedding consists of a felt cushion, blankets, sheets, pillow stuffed with coir, and a carpet to tie up the whole in.
7. The following table gives the dimensions, &c. of the tents used in camp:—

Description of Tents.	Dimensions.		Space allotted to each Man.			Materials of which compose
	Superficial Area.	Cubical Space.	Number of Men to each Tent.	Superficial Area.	Cubical Space.	
	Sq. ft. in.	Cub.ft. in.		Sq. ft. in.	Cub.ft. in.	
Tent, hospital, European soldiers' double-walled - - - - - - -	330 0	2,655 0	12	27 72	221 432	Cloth dungaree, double, outer white; lining either blue, red, or yellow. Poles, some of bamboo, some of teak.
Do. Staff Serjeants', N.P. - - -	100 0	717 272	1	—	—	
Do. European soldiers' double-poled - -	330 0	2,655 0	22	15 0	120 0	
Do. do. single-poled - -	112 6	1,157 12	13	8 8	88 0	
Do. Native, double-poled - - -	361 0	1,114 11	30	12 0	37 139	
Do. do. hospital - - - -	330 0	2,655 0	12	27 72	221 432	

8. In barracks, ventilation is effected by means of ventilators of different descriptions, fixed to the ridge of the roof. No measures are taken for ventilating tents beyond the doors, and taking precautions against crowding within them. The ventilation of the sepoys' huts is left entirely to themselves; but the ventilation of the guard-room is secured in the same manner as the barracks. Considerable attention is paid to the subject of ventilation, and all Government buildings are periodically inspected by responsible officers. The air in barrack rooms is cooled by "kuskus tatties," which are kept continually wet. A tatty 7 feet by 4 feet would cost 4 rupees, and a bheestie at 7 rupees per mensem, and one coolie at 3 rupees 8 annas, would be able to keep watered the windows and doors of a barrack for 100 men.
9. The barracks are constructed of burnt bricks and lime, with thatched roofs. The principal material made use of in the construction of tents is a description of cotton cloth called "dungaree," of which there are 4, 5, or more folds in the top and walls. Huts are constructed by the sepoys themselves out of an allowance made them by the Government, and are of the poorest description, being mud walls, averaging 10 feet square, and 5½ in height, with a thatched roof.
10. Floors are invariably raised above the ground level, but there is no passage of air beneath. If not paved with stone they are made of clean gravel and sand well watered and rammed; the surface being plastered once a week, or oftener, with cowdung.
11. Regarding the material of which the barracks at this station are constructed, we have no objection to raise, believing it to be an established fact that thatched roofs are cooler than those that are tiled. As to the construction it would be quite possible to improve the design, as the present buildings were erected some 30 years ago; but whether such alterations and improvements would increase their salubrity very materially we cannot pretend to say, the hospital reports being most favourable. Still, we are of opinion, that if additional accommodation for lavatories was available, the comfort of the men would be very materially increased. All repairs to barracks and buildings in the cantonment, and the repairs of all roads, &c. are executed by the executive engineer; the responsibility of the general sanitary state of the cantonment resting with the barrack-master under the orders of the brigadier commanding. The walls and ceilings of barracks are cleansed and limewashed once every six months.

SHOLAPORE.
BOMBAY.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	12. There are properly speaking no lavatories, the men washing themselves in one end of the verandah of the barrack; but at a short distance from the barrack there is an excellent plunge bath 30 by 20, and 4½ feet deep at one end and 8 feet deep at the other. This bath is well supplied with water from a reservoir, and constantly changed, the bath being emptied by a drain leading to the bed of a nullah about 100 yards off. 13. The cook-houses are of the ordinary description made use of in this country, merely a cooking range with iron tripods for camp kettles; the ingenuity of the cooks supplying all deficiencies of apparatus. Water is supplied by bheesties, and the refuse water is drained away into sinks at the corners outside, which, when full, are emptied by sweepers and others retained for the purpose, and the contents removed to a distance. All arrangements for washing and drying linen are left to the regimental dhobies, and the present system is unobjectionable. 14. The contents of the privies are immediately removed, and the urinals frequently cleansed with lime, and the buildings themselves are all that could be desired. We believe it to have been established that it would not do to allow either cesspits or urinals to remain unemptied for any length of time, and the actual design of a privy in the absence of such pits and urine basins is immaterial. 15. These buildings are sufficiently ventilated by honeycomb tiling in the walls, but are not lighted at night. 16. There are no sewers or drains whatever in the vicinity of the barracks; all refuse water, &c. being removed as before mentioned. There is no part of any of the buildings in any locality damp. The drainage is sufficient; the only fluid refuse of the barracks is from the men's lavatories, which is thrown out on the surface and evaporates; all other fluid refuse, as before stated, being removed. No cesspits exist, the litter heaps being the only things of the sort near the men's quarters and hospital, but as the manure is removed daily, they can scarcely be designated a nuisance; no smell being perceptible even in the immediate vicinity. There are no foul ditches. 17. The surface cleansing within the cantonment and its vicinity is efficiently done, an establishment being kept up for the purpose, and the work at some part or other of the camp carried on daily. The refuse manure, &c. is carted to different distant localities, and burnt or buried. 18. The surface of the cantonment is kept free of vegetation; no old walls, thick hedges, &c., or other obstructions to the ventilation of the station, exist. 19. The bazaar is clean, well drained, and ventilated. The water supply is derived from wells which, though not affording a very ample supply in the immediate neighbourhood, still no scarcity is complained of except during seasons of drought. Existing regulations secure cleanliness and efficiency in all sanitary arrangements, and though no paid establishment exists for this purpose (owing to the military bazaars here not being very extensive), the sanitary condition appears to be all that is desirable. In large bazaars not removed to any great distance from native towns, probably improvements in the sanitary police would be necessary, but none in our opinion is called for at Sholapore. A superintending officer looks after the native houses in the Sudder bazaar; no other native houses exist near the station, nor any dung-heaps or cesspits. None of the native houses are to the windward of the barracks. 20. There are two slaughter-houses within the bazaars of the cantonments, which are kept clean by means of a fund created for that purpose, called the slaughter-house fund. Each butcher slaughtering an animal pays a small fee, which is devoted to the above purpose, and to the carrying away out of camp all offal and refuse. Strict supervision is exercised over all slaughter-houses; and a peon is constantly in attendance to prevent nuisance, either in them or the adjoining meat markets. No nuisance from these places has been complained of. 21. No person is allowed to picket an animal of any description in or near a road, except in places devoted to the purpose, which last are visited daily to see that there is no accumulation of litter. The manure is, generally speaking, made into fuel, which is done in open and uninhabited places far from any houses. This fuel is valuable, from the scarcity and consequent high price of wood. 22. At this station the artillery and cavalry horses are (with the exception of those that are sick) picketed in the open and appear very healthy. The dung-heaps are, together with the litter, quickly removed by the buffalo keepers, to whom it is sold, and we have reason to believe that they give it to the buffaloes as a portion of their food. The picketing grounds are clean and remarkably well kept. 23. No married people occupy barrack rooms; but such quarters as do exist at this station for married soldiers are not creditable to the Government. Suitable buildings have been estimated for, but no steps appear likely to be taken for securing the erection of the buildings.
Officers' Quarters.	1. The officers' quarters at this station consist of detached bungalows. The drainage and ventilation of these buildings, we believe, are suited to the wants of the officers. We have no improvements to suggest; as the regulations provide for the removal of any unhealthy or dilapidated quarters situated within the cantonment limits.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining native population are generally healthy, excepting epidemics. 2. The civil surgeon at Sholapore (a resident of nine years) states that the most prevalent are quotidian, intermittent fever, diarrhœa, dysentery, and guinea worm. Cholera and small-pox occur epidemically at certain seasons, but seldom to a great extent; and less among the inhabitants of the cantonment and town of Sholapore than amongst those resident in certain parts of the districts. Diseases of the spleen are not of very common occurrence. 3. The causes to which the diseases prevailing among the native population may be attributed are, principally, exposure to alternations of temperature without proper covering, improper or insufficient food, neglect of ordinary sanitary precautions in the arrangements of their dwellings, abuse of intoxicating drugs, and the impurity of the water during the hot season. Their immunity from many diseases is referable to the character of the soil, freedom from jungle and other sources of malaria, and the general equability of the climate. 4. The artillery came from Poona, where they had been for six months, and which they left on the 7th January 1858. Their state of health there was good, the regiment having chiefly suffered from fever. On arriving at Sholapore they were in good health, and since then intermittent fevers have been the cause of the greater number of admissions into hospital.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	The cavalry came from field service at Jhansi, where they had been for 18 months, and which they left on 2nd December 1859 in good health. Fever was the most prevalent disease there as here, but their health since arrival has been generally good. The native infantry came from Dharwar, where they had been for two years and eleven months. The state of their health there was good, the regiment having chiefly suffered from intermittent fevers and diarrhœa. The prevailing diseases since arrival at this station have been fever and dracunculus. No portion of the men's present accommodation is more unhealthy than the rest. 5. The troops are never camped out. 6 to 13. No experience with troops at hill stations. 14. Frequent change of station we consider would be decidedly beneficial to troops. 15, 16. No experience of hill stations. 17. We are not aware that there is any high ground near the station which could be advantageously occupied as a hill station. 18. Cannot say which is the healthiest or unhealthiest class of surface and subsoil for stations. 19. Soldiers should not proceed to India before they are 20 years old, but as soon after that age as possible. Troops should land in India between the months of November and January, and recruits should be sent at once to the Deccan, in order to preserve their health. 20. Troops intended for the Bombay Presidency, if they were sent immediately to the Deccan, might, without any evil consequences, come direct from home to India. It would be advisable that new troops on landing should be sent to a station where there is another regiment that has served some time in India, whether it be in the plains or on the hills, but the latter would be preferable. 21. The usual mode of transport into the interior is by marching early in the mornings at the rate of 10 miles a day, with occasional halts, the men invariably passing the day under canvass. We cannot recommend any additional precautions, and, provided the season of the year is favourable, the health of troops on the march is, we may say, proverbially good. 22. No experience to say what is the number of years a British soldier should serve in India. 23. We think that medical boards should assemble in every division with the deputy inspector-general as president, when practicable, whose decision shall be final. In the event of the deputy inspector-general not being president of the divisional committee, the opinion of such committee should in no case be final. 24. The end of December or the beginning of January is the time of year for invalids to leave India for home, if proceeding by the Cape of Good Hope route.
Diseases.	1. There are no inspection parades at the station for the discovery of incipient diseases. 2. There have been cases of scorbutus in the European artillery and native cavalry and infantry, but were attributable to service in Persia, Central India, and previous disease. They have all recovered. 3. Hepatic disease does not exist at this station. 4. The proportion of cases admitted of dracunculus for the last year is 6·75 per cent. It is attributed to the men drinking and bathing in impure water, but we cannot suggest any prophylactic measures. 5. The proportion of admissions from venereal disease to the total admissions for last year has been 2·25 per cent., and the proportions of constantly sick from venereal disease to the total sick has been 1·04 per cent. for the past year. The establishment of lock hospitals would not prove disadvantageous. 6. We have not had any epidemic at this station for some time. The prevailing diseases are fevers of the intermittent quotidian type in a mild form. There have been but few cases of rheumatism. The want of correct data prevents our giving the proportion which admissions and deaths from fevers, dysentery, cholera, small-pox, and rheumatism, bear to the total admissions and deaths. 7. The principal zymotic diseases met with amongst the native population of Sholapore are, of endemics, intermittent fever, which generally assumes the quotidian type; of epidemics, cholera in its spasmodic form, and choleraic diarrhœa. Of contagious diseases, small-pox and measles are the most frequent. Intermittent fever prevails more or less in the months of November, December, and January, which are characterized by hot days and cold nights, a strong drying easterly wind, and hot sun. The months of May, June, July, and August, during which cholera prevails, are for the most part hot, cloudy, and oppressive, with occasional showers of rain, and a highly electrical condition of atmosphere. When small-pox and measles prevail, which is in the months of March and April, there is nothing observable in the state of the air, the temperature being equable and warm, and the atmosphere clear. We are not aware, however, that the diseases above enumerated are more prevalent in one locality than another. Imperfect ventilation of their dwellings, scanty unnutritious diet, and neglect of the ordinary sanitary precautions, are the causes which predispose the native population to the attacks of the above-mentioned diseases, and conduce to a larger rate of mortality than would otherwise obtain here. 8. No reply to this question. 9. Quinine has not been tried at the station as a prophylactic against malarial disease. 10. The measure to be taken for the prevention or mitigation of epidemic disease is removal from the spot where the disease is prevalent.
V. Intemperance.	1. The soldiers at the station are temperate, only two men out of the 76 forming the artillery company being confirmed drunkards. 2. The medical officers cannot prepare the statistical table of the effect of total abstinence temperance, and drunkenness on the amount of sickness, mortality, and crime at the station having been generally in charge of native troops, with an occasional temporary charge of detachments of Europeans. Drunkenness is always punished as an offence. 3. Spirits, supplied by the commissariat department 24 degrees below proof, are sold in the canteen, also brandy and gin under certain regulations. It is strictly against orders for a bazaar shopkeeper to sell liquor of any sort to a soldier. A man may have either two drams of spirits or two quarts of malt liquor, or one dram of spirits and one quart of malt liquor; but he cannot have two drams of spirits and one quart of malt liquor, or two quarts of malt liquor and one dram of spirits, without permission. Spirit is no part of the soldier's ration at the station, on march, or in the field; he pays for it on all occasions, and has one quart of porter and one dram of spirits on payment. The commissariat department, however, cannot always supply porter; and when such is the case, two drams of spirit per diem are

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	supplied on payment. The canteens are not opened for spirits until evening, in quarters. On the march the grog is generally served out as soon as possible after arrival on the new ground, say 8 a.m., the men usually preferring it at this hour. No ill effects are attributed to this practice, particularly as the men do not go out much in the sun after morning's march. Spirit is never given as a ration to convalescents. No injurious drinks other than intoxicating drinks are sold in the canteen; but in the bazaar, where soldiers manage to get drink notwithstanding all endeavours to prevent it, all manner of compounds are sold, which, if not decidedly poisonous, must be injurious to health. 4. The consumption of spirits is, we think, injurious to health, and cannot conduce to the efficiency and internal discipline of the corps. 5. It would be beneficial to abolish the spirit ration. If this were not advisable, it might with advantage be restricted considerably. 6. The influence of malt liquor on health is more beneficial than spirits. 7. Soda water, lemonade, and ginger beer (a very objectionable drink, in our opinion, being made with toddy, or the date-tree juice, to insure the "pop,") are sold by a few shopkeepers in the bazaars, but, owing to similar articles being attainable in the coffee-shops, no large sales are made, and, except during the hot months, the quantity consumed is not large. We would recommend that the soldier should be supplied with malt liquor in moderate quantities, and the oftener in the day the better. 8, 9. It is difficult to say whether it would be beneficial or otherwise to suppress altogether the spirit ration, and to substitute for it beer, tea, or coffee, &c. There are some men in every company who cannot do without spirit; and if the ration of wholesome spirit from the canteen was withheld, they would procure most poisonous compounds from the bazaar, which are there sold so cheap that a man may become intoxicated for a couple of pice (one penny). 10. No recommendations are made on any of these points besides such as are contained in the foregoing replies. 11. The canteen and bazaar regulations are those contained in Section X. 3rd Appendix, Jameson's Code, which are in general use in the Bombay Presidency.
VI. DIET.	1. The composition of the daily ration for Queen's British troops and European troops in the Indian army is as follows:—1 lb. bread, 1 lb. meat, 4 oz. rice, 1 oz. salt, 2½ oz. sugar, $\frac{10}{21}$ oz. black tea, $\frac{5}{21}$ oz. green tea, 3 lbs. wood, and 1 lb. vegetables. No periodical changes are made that we are aware of. The commissariat officer is directly responsible for the quality of the rations issued to the troops, but they are also inspected by the orderly men, told off for the duty by the quartermaster-serjeant, and by the orderly officer of the day. The inspection is made early in the morning, when the provisions are brought. 2. Vegetables are provided as above, but no fruit. The men breakfast at a quarter to 8 o'clock a.m., dine at a quarter to 1 p.m., and have supper at sundown. At breakfast they have tea, bread, and meat; at dinner, meat, vegetables, and bread, if they choose; and at supper, bread and tea. The stoppage for the ration is 3 annas 4 pice daily, in addition to which 6 pice, or half an anna, are stopped daily for providing them with extra vegetables. 3. The addition of milk to the ration would be beneficial in our opinion. The rations are given in charge to the orderly men after being inspected, and it is the duty of the orderly men to make over the same to the cooks, and look after their work in preparing the same for the men. 4. The cook-rooms are Government buildings, the cooks being paid by the men, as soldiers do not cook for themselves, generally speaking, in this country. The copper camp kettles, supplied by Government, are the only means of cooking available. The kitchens are kept clean, well lighted, well ventilated, and sufficiently supplied with water. The food, as a rule, is boiled or stewed, the cooks dressing each man's dinner, as far as practicable, according to his wish; for instance, one man may like a curry, and two or three a pie, which are thus prepared by the cooks. The cooking is properly done, and sufficiently varied; tea and coffee are efficiently prepared; but the men who wish for it carry the latter from the coffee-shop. We believe that if the men wish for tea, coffee, or other refreshment before a march, they have to make their arrangements for it. The coffee-shop keeper at this station sends round the coffee for the barracks at 4 o'clock a.m., so that the men may have it before parade, if they wish; probably similar arrangements would be made on the march. 5. Soldiers' gardens could be advantageously established, if the men would take the trouble of working in them; some of the men have them already. Gardens for the cultivation of vegetables could be only advantageously established under Government control, and the soldiers be paid for working in them.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The European soldier wears a cloth jacket or tunic, and serge or cloth trousers, as warm clothing, and a rusty drab coloured loose khakee (jacket and trousers) as light clothing, with a wicker helmet, having a padded cover of khakee and a forage cap as head-dresses. The only belt they wear is a waist-belt, from which is suspended the sword. The present dress, having been suggested and adopted by urgent necessity, is suitable to the climate, especially the khakee clothing. The wicker helmet is an admirable head-dress. It would be impossible to have one particular suit of clothes which would be adapted to day and night duties and the cold and hot seasons. As a general rule, we consider that if cotton shirts were done away with as regimental necessaries, and flannel shirts substituted, it would be an improvement, and the advisability of obliging each man to wear a flannel belly-band cannot be questioned. At present the men mount guard in khakee, and put on cloth shell jacket and serge trousers at picket mounting. The only sentry by day has a verandah to pace up and down in.
Duties.	1. Being of opinion that it is very desirable for the European constitution, that the soldier should arrive in this country as soon after attaining the age of 20 as possible, we consider that the health of the recruit would subsequently be beneficially affected by his being drilled after arrival in India. 2. The routine of a soldier's duties is as follows:—A man who has finished his drill attends morning parades (which last an hour) on five days in the week; his tour of guard comes round once in four, five, or six days, according to the number of men present; when not on guard, he cleans his arms and accoutrements if they require it; makes up his kit on the cot and shelf, according to regulation, has to attend afternoon roll call and answer to his name

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*cont.*	in barracks at tattoo roll call. The men do not suffer in any way from drill. The best time for drills and parades is early in the morning, all the year round; for marches, in the cold weather, early in the morning; and in the hot weather at sunset. At present the men have four nights in bed during the week to one on guard or picket. 3. The only European guard is mounted not 50 yards from barracks. The guard stays on for 24 hours, the picket for less than 12 hours. There are roll calls by day, but none later than tattoo at night. Night guards at this station are not at any time of the year injurious to health, and we are unable to suggest any additional precautions in performing this duty.
VIII. Instruction and Recreation.	1. The following are the means of instruction and recreation at the station:—There is a ball court, also a skittle ground, which in our opinion ought to be roofed. There is a library, which is lighted at night, and a school, but no trained schoolmaster. No day rooms or soldiers clubs exist; there are however plots of ground which the soldiers can cultivate; but there are no workshops, theatres, or gymnasia, and the means are not sufficient to keep the men occupied during the wet season and the heat of the day. The men are restricted from exposing themselves to the sun and rain when off duty, and the restriction is attended with considerable benefit to health. 2. Workshops for all common trades, which are a great desideratum, should be established, and also gymnasia; one large and lofty open shed might be constructed and so arranged as to afford the extra accommodation required. 3. Soldiers' savings' banks would be decidedly advantageous, provided workshops were established, in which the men might carry on a profitable business in trades in which they might be skilled, such as tailors, shoemakers, carpenters, &c., We consider that such an arrangement might have a good effect in inducing many to be industrious and keep out of the canteen. 4. There are no trees or sheds to enable the men to take exercise without injury to health during the day, and the verandah space is too limited to be of any use.
IX. Military Prisons.	1. Considering the climate of this station, we consider the prison cells small and badly ventilated.
X. Field Service.	1. There are no local regulations for field medical service. 2. The medical officers have no power whatever as regards the line of march of troops, bivouacking, camping, &c. 3. We would recommend that the senior medical officer should accompany the assistant quartermaster-general to select the site of the camp. The medical officer at present has no power in these matters. 4. The arrangements adopted in the Presidency for field hospitals, ambulances, transport of sick, and hospital supplies are according to the Presidency Medical Regulations.
XI. Statistics of Sickness and Mortality.	The following is the information under this head:—

Sholapore.

European Troops.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1857-58	Detachment H.M. 56th Regiment	61	10	—	—	—	5	—	—	—	4	—	1	—	—	—	5	—	25	—	40·9	—
1858-59	Do. 3rd Dragoon Guards Do. 17th Lancers Do. 18th Royal Irish Do. 33rd Regiment Do. 56th do.	201	153	2	—	—	9	—	12	—	33	1	3	—	—	—	149	1	359	4	178·6	1·9
1859-60	Do. 3rd Dragoon Guards Do. 18th Royal Irish Do. German Legion	314	978	3	2	—	37	—	25	2	115	7	9	1	20	9	235	—	1,421	22	452·5	7·0
	European Troops in the Indian Army.																					
1850-51	1st Company 1st Battalion Artillery	105	23	—	—	—	3	—	1	—	4	—	—	—	—	—	24	—	55	—	52·3	—
1851-52	Do. do.	105	127	1	—	—	3	—	1	—	13	—	4	—	—	—	75	—	223	1	212·3	0·9
1852-53	Do. do.	111	171	1	—	—	11	—	3	—	14	1	3	—	—	—	67	—	269	2	242·3	1·8
1853-54	Do. do.	105	114	1	2	—	10	—	6	—	32	—	1	—	—	—	86	—	251	1	239·0	0·9
1854-55	1st Company 2nd Battalion do.	33	81	—	—	—	2	—	2	—	19	1	—	—	—	—	32	1	86	2	260·6	6·0
1855-56	Do. do.	95	104	—	—	—	5	—	18	—	25	—	1	—	—	—	105	—	258	—	271·5	—
1856-57	Do. do.	58	30	—	—	—	1	—	6	—	6	—	—	—	—	—	55	—	98	—	168·9	—
1857-58	Detachment 4th Troop Horse Brigade Detachment 2nd Company 2nd Battalion Artillery 3rd Company 2nd Battalion Artillery	67	26	—	—	—	2	—	2	—	11	—	3	—	—	—	54	—	98	—	146·2	—
1858-59	Do. do.	98	22	—	—	—	7	—	2	—	20	—	6	—	—	—	65	—	122	—	124·4	—
1859-60	Do. do.	84	174	—	—	—	6	—	2	—	17	1	1	—	1	1	42	—	243	2	289·2	2·3

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References to Subjects and Queries.

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XI. Statistics of Sickness and Mortality—*cont.*

NATIVE TROOPS.

	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850–51	20th Regiment Native Infantry Detachment Poona Irregular Horse	874	134	1	9	—	—	—	—	—	35	—	—	—	—	—	154	1	332	2	37·9	0·2
1851–52	20th Regiment Native Infantry	826	129	1	3	—	4	—	—	—	29	—	3	—	2	1	186	—	356	2	43·0	0·2
1852–53	20th do. do.	847	222	1	1	—	3	—	3	—	52	3	5	—	—	—	212	—	498	4	58·7	0·4
1853–54	3rd do. do. 20th do. do.	798	192	—	1	—	7	—	—	—	72	2	3	—	—	—	307	—	582	2	72·9	0·2
1854–55	3rd do. do.	797	439	1	—	—	8	1	2	—	53	—	8	—	—	—	272	—	782	2	98·1	0·2
1855–56	3rd do. do.	820	157	2	—	—	9	1	1	—	53	—	6	—	—	—	265	3	491	6	59·8	0·7
1856–57	6th Company 4th Battalion Artillery 3rd Regiment Native Infantry	855	213	1	5	—	11	—	1	—	77	—	10	—	—	—	380	—	697	1	81·5	0·1
1857–58	3rd do. do.	976	214	3	32	—	23	1	2	—	47	—	4	—	7	1	292	—	621	5	63·6	0·5
1858–59	Left Wing 3rd Regiment Light Cavalry 3rd Regiment Native Infantry 28th do. do.	949	249	1	9	—	13	—	—	—	61	1	6	—	—	—	360	—	698	2	73·5	0·2
1859–60	3rd do. Light Cavalry 28th do. Native Infantry	1,079	1,375	1	5	—	19	2	5	1	97	3	8	1	10	2	493	5	2,012	15	186·4	1·3

WOMEN AND CHILDREN.

Years.	CORPS.	Women.									Children.							
		Strength.			Treated.		Died.		Ratio per cent. to Strength.		Strength.			Treated.		Died.		Ratio per cent. to Strength.	
		Europeans.	Indo-Europeans and Natives.	Total.	Europeans.	Indo-Europeans and Natives.	Europeans.	Indo-Europeans and Natives.	Treated.	Died.	Europeans.	Indo-Europeans and Natives.	Total.	Europeans.	Indo-Europeans and Natives.	Europeans.	Indo-Europeans and Natives.	Treated.	Died.
1852–53	1st Company 1st Battalion Artillery	8	6	14	12	13	—	—	178·7	—	16	8	24	11	6	2	—	70·8	8·3
1853–54	Do. do.	7	8	15	21	—	3	—	140·0	20·0	16	8	24	10	5	2	—	62·5	8·3
1854–55	1st Company 2nd Battalion Artillery	14	8	22	7	6	—	—	59·0	—	14	11	25	4	3	—	—	28·0	—
1855–56	Do. do.	9	9	18	25	10	1	—	194·4	5·5	30	34	64	29	35	2	1	100·0	4·6
1857–58	3rd Company do.	8	5	13	—	—	—	—	—	—	14	8	22	—	—	—	—	—	—
1858–59	Do. do.	10	5	15	3	2	—	—	33·3	—	19	10	29	3	—	1	—	10·3	3·4

By order of the Principal Inspector-General, Medical Department.

W. C. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1861.

XII. HOSPITALS.

1, 2. The site of the European artillery hospital is open and freely ventilated, and everything that could be desired. The native infantry and cavalry hospitals are, we think, sufficiently commodious and well ventilated.

3. The hospital is supplied with excellent water from a well distant half a mile. It is conveyed to the building by puckal bheesties, and there does not seem to be any necessity for improving it in this respect.

4. All fluid refuse is removed from the vicinity of the hospital by an establishment of sweepers and others, kept up for the purpose. There are no drains or sewers whatever.

5. The lowest wards are raised one foot above the ground and are solid. There is no contrivance for the free perflation of air underneath the floors, and taking into consideration the site, the committee is of opinion that no such contrivance is called for. Owing to there being a gentle slope on all sides of the hospital, the roof water is quickly got rid of, and obviates the necessity for any provision for conveying it away. The surface drainage about the hospital is sufficient to carry away the rain-fall rapidly. The walls of the hospital are constructed of burnt bricks and chunam, with a double-tiled roof having ventilators. Neither the walls or roof are double, but the verandahs all round the building are well shaded, and the hospital kept sufficiently cool. The verandahs are eight feet broad, and with the addition of bamboo matting weather frames afford sufficient shelter from the sun's rays. Being shut in, they afford accommodation for the exercise of convalescents, and are, from want of room, made use of for other purposes. This objectionable practice will cease as soon as the extra ward, sanctioned by Government, is erected. The hospital accommodation is on the ground floor only.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	Table of Hospital Accommodation. Date of construction, 1830. Total number of wards - - - - 3 Total regulation number of beds - - - 28

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet. In.	Feet. In.	Feet. In.	Feet.			Inches.		Feet. In.	Feet. In.
2 - - -	10	31 6	24 0	14 9	11,150·5	1,115·05	75·6	18	4	5 4	3 10
1 for women -	8	30 2	21 10	17 0	11,196·43	1,399·5	82·3	18	6	7 6	4 5

The hospital is placed so as to receive the full benefit of the prevailing winds. The windows are of the ordinary construction, and might be altered so as to open vertically (for the top half) as well as horizontally with great advantage.

6. Iron revolving cowl ventilators are fixed to the ridge of the roof, and appear to secure efficient ventilation. There are no jalousies or jhilmils, but the glare is kept out by the bamboo matting weather frames, or sun shades.

7. The air admitted into the wards during the months of April and May is cooled by means of kuskus tatties.

8. There are no means of warming the wards. The wards and ceilings are whitewashed and cleansed every three months, and whenever found necessary.

9. The privies are properly cleansed, and all that is offensive daily removed by sweepers. They are not more offensive than the best of such places usually are in this country.

10. The lavatory arrangements might be greatly improved, and the health and comfort of the sick would be greatly enhanced thereby. The present arrangements appear to be a make shift.

11. There is a bath room to the hospital, but all apparatus is entirely wanting, to the great discomfort of the soldier.

12. The washing and drying of hospital linen is left to the regimental dhobies, and no inconvenience apparently results therefrom.

13. The hospital was erected 30 years ago, and the accommodation of course is in every way susceptible of improvement; but with regard to the storage, looking to the generality of such buildings in this country, we have nothing to condemn strongly in the European artillery hospital here.

14. The cots in the hospital are generally of iron, with straw mattresses laid on them. No improvements in these are suggested.

15. The means and apparatus for cooking are primitive, but such as have been found best adapted for the Indian cook.

16. Diet tables, diet rolls, &c. are according to regulation.

17. The provision for attendance on the sick is good and sufficient.

18, 19. The sanitary condition of the hospital is good, no epidemic diseases of any kind have appeared. No improvements are suggested.

20. The accommodation for exercising the convalescents is limited to the verandahs adjoining the hospital ward.

21. Although there is a ward for women in the compound they prefer remaining in their own huts, and with their children are usually attended there by the medical officer. No resident matron is allowed for the hospital, but considering the small number of women and children, and provided suitable quarters for the married people were erected (which the committee believes is in contemplation) the present arrangement is conducive to comfort, and in no way objectionable.

22. There are no special local hospital regulations enforced at the station, not included in the General Presidency Medical Regulations.

23. All recommendations made by the medical officers with reference to the sanitary state of the hospital, &c. are immediately attended to.

24. There are no convalescent wards or hospital at this station, nor would they be of any advantage, considering the small number of Europeans present.

XIII. Burial of the Dead.

1. The British burial ground is situated in the station, but it does not appear to be badly placed as regards the prevailing wind.

2. Its area is 14,000 square yards, and its soil is alluvial, lying on rock. The drainage is efficient, owing to the ground being placed on the sloping bank of a nullah. The ground is well kept.

3. The grave space allowed is 7ft. by 3ft., and the interval between graves 6 feet; the depth is 5 feet. Graves are scarcely ever re-opened, and no more than one body is buried in the same spot. Interment is compulsory at ordinary times, and during epidemics within 12 hours after death. The conditions of interment and cremation of native troops are the same. The native burial and burning grounds are looked after by the barrack department under the orders of the brigadier.

4. The graveyard has never been offensive. The regulations with regard to the burial of British troops are strictly enforced.

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References to Subjects and Queries.	Replies.
XIII. Burial of the Dead—*cont.*	5. The dead of camp followers or bazaar people are burnt or buried at localities set apart for the purpose in the vicinity of the camp. 6, 7. No injury appears to have accrued to the public health from the present practice, and no improvements are suggested in the burial or disposal of the dead, as the existing arrangements provide for all requirements under this head.

(Signed) J. S. DOWN, Brigadier, Commanding at Sholapore. — President.
PARR W. HOCKIN, Surgeon Major, H.M. 3rd Reg. Bombay Light Cavalry.
W. W. GOODFELLOW, Captain, Bombay Engineers.
L. S. BRUCE, Assistant-surgeon, 28th Reg. Bombay Native Infantry. — Members.

11th October 1860.

SURAT.

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Accommodation:

- Queen's Troops — Infantry, Detachment H. M. 4th Foot (non-commissioned, rank and file) can be accommodated in the Castle.
  - European officers - 3
  - Married families - 3
  - Non-commissioned, rank and file - 170
- Native troops
  - Artillery, non-commissioned, rank and file - - - - - 36
  - Infantry, H. M. 16th Regiment Bombay Native Infantry, non-commissioned, rank and file - - - - - - - - 938

References to Subjects and Queries.	Replies.
I. TOPOGRAPHY.	1. The general aspect of the country surrounding the station is open and flat, dry during the cold and hot seasons, swampy during the monsoon. There is but little wood or jungle in the neighbourhood, but an abundance of water. 2. The elevation of the station is 33 feet above the level of the sea, but is on a level with the adjacent country. It is 18 feet above the level of the Taptee river. There is no higher ground adjoining the station. 3. The low hills of Rajpeepla commence at Vusranee, 29 miles to the north-east and by east of Surat. The nearest mountain is Songhur, about 42 miles east of Surat, and the nearest table-land is 40 miles in the same direction beyond Songhur and at the top of the Rondabarree Ghaut. The height is the average of that of the Western Ghaut. 4. The nearest water to the station is the Taptee river, which forms the north-west boundary of the camp, and sometimes overflows, and the camp is then completely under water from one to ten feet in depth. There is neither broken ground, ravines, nor water-pits near the station. 5. With the exception of the eastern boundary, which is framed by the town, the camp is open and well ventilated. The temperature of the station is not raised by the buildings being exposed to reflected sun heat. From March to October the sea breeze prevails, and during the remainder of the year the land wind is predominant. The effects produced upon different individuals by these two winds vary considerably, but generally speaking fever is most prevalent during the appearance of the land winds. 6. The country surrounding the station is cultivated. There is no artificial irrigation, but a few gardens which are watered from wells, nothing more. Rice is not cultivated nearer than four miles from the camp. No indigo is cultivated near the station, but hemp is prepared about four miles off on the other side of the town; no nuisance is experienced from it in the camp. 7. The large and populous city of Surat forms the north-east boundary of the camp. 8. The geological structure of the surface of the station is a black soil, varying in depth. Beneath is a thick clay, in which a large quantity of lime-stone gravel is found (morum), and beneath that again, at the depth of 18 or 20 feet, basalt. 9. Water is found at a depth varying from 20 to 30 feet in the dry season, and the wells have about five or six feet more water in them during the monsoon. 10. A small portion of the rain-fall is absorbed into the soil; more runs off by artificial and natural drainage, but some quantity lies on the surface till it evaporates. There is no higher ground adjacent. 11. The water supply of the station for drinking purposes is derived from wells, the river is also occasionally used by the natives for bathing. There are no tanks either in the station or near it. The wells are not liable to pollution from leaves or other matter falling into them; no foul drainage or surface impurities are allowed to drain into them; no nuisance or malaria proceeds from the wells. 12. There is not a well containing good drinking water in the station, every one being more or less impregnated with salt. Some of the water is very foul and appears to be impregnated with sulphureted hydrogen gas; but there are two wells beyond the limits of the camp from which tolerably good water can be obtained. There is no record of its chemical analysis, but it may be said to be decidedly brackish: its microscopic characters are unknown, nor can they be ascertained by any instrument at the station. The water within camp limits is so bad that no one thinks of drinking it; it is raised by hand in leather buckets. Fresh and good water might be obtained in abundance by means of pipes laid from a point about 10 miles up the river from the station; this might also be made available for the inhabitants of the city. 13. It would be advisable to remove the native lines, which are very old and in a hollow, and have long been condemned by competent authorities, to a spot a little to the left of the Domus road, which is a few feet higher than the present situation. It may be observed, that if the slightest inundation occurs the lines are the first flooded. 14. New stations are selected by a mixed committee composed of officers from the quartermaster-general's department, and also engineer and medical officers, but what weight is attached to the opinions of the various departments is unknown.

References to Subjects and Queries.	Replies.

II. Climate.

1. The only meteorological instruments at the station are a thermometer, rain gauge, and weather cock.

2. Table of meteorological observations from 1st January 1850 to 1st January 1860.

Months.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.
1850–60.				
January - -	72·9	28·2	87·3	59·1
February - -	76·9	22·1	91·3	69·2
March - - -	84·1	27·6	97·7	70·1
April - - -	88·0	24·6	100·5	75·9
May - - -	89·4	20·4	100·4	80·0
June - - -	87·1	14·2	94·3	80·1
July - - -	84·0	12·0	89·9	77·9
August - -	82·5	8·4	87·0	78 6
September - -	83·3	12·8	89·9	77·1
October - -	82·6	19·9	92·8	72·9
November - -	78·1	23·6	90·5	66·9
December - -	74·3	25·0	87·5	62·5

3. For about nine months in the year the climate may be said to be decidedly moist, the wind coming from the direction of the sea, which is only about 10 miles distant. It is never very cold, and the temperature rises considerably as elsewhere during the months of April and May. There is but little, if any, fog in the camp, though it is sometimes observed on the other side of the river, which is somewhat on a lower level. There is no irrigation to speak of, therefore the climate is not perceptibly influenced by it. There are occasional dust storms, but generally speaking the atmosphere is free from dust, as the wind blows from the sea chiefly over cultivated lands. No medical officer present having been in Surat more than a few months, no trustworthy information can be afforded as to the effect produced on the health of the troops by the above climatic characteristics. From the end of the monsoon, that is to say, from the beginning of October to the middle of December, is the most unhealthy period of the year, when intermittent fever is the prevailing disease.

4. Domus, on the sea shore about 10 miles west of Surat, possesses the following advantages over this station:—The air is cooler and purer, and there is an abundance of good water in tanks, which if proper care is taken would contain water all the year round.

5. The following is a list of stations in India at which I have served, viz.:—Poona, Ahmednuggur, Dharwar, Belgaum, Kurrachee, Vingorla, Asseerghur, Nassick, Sattara, Bombay, Surat, Broach, Ahmedabad, Sholapore, Rajcote, Bhoog, Hyderabad (Sinde), Jacobabad, Sukkur, Shikarpore, Neemuch, Nusseerabad, Mhow, Dhoolia, Mulligaum, and Tanna. Of these the first 10 may be said to be salubrious climates, and Neemuch and Mhow, the next best adapted to health. The most injurious to European constitutions are probably Jacobabad, Suckur, Shikarpore, and Nusseerabad.

III. Sanitary Condition of Station.

1, 2, 3. Map and general plans of the station and surrounding country, with plan of the barracks, are transmitted.

4. Table of barrack accommodation. Date of construction of barrack unknown, the barrack being part of the Castle buildings, which were constructed before the English took possession of Surat. But they were adapted for the residence of the European troops in 1857, by providing for light and ventilation. Ten pendalls for Native Infantry were constructed in 1824, and the other four in 1840.

Total number of rooms or huts:—Barrack rooms for European troops, 4. Pendalls for Native Infantry, 14.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.	Remarks.
In the Castle.		Feet.	Feet.	Feet.	Feet.			Feet.		Feet.	Feet.	
One on the south side of the Castle.	63	157	25	11 mean	43,175	685·318	58·582	1½	28	15	5	3
										13	6 5	3
North-east Tower - -	25	75 mean	20 mean	8	12,000	480	60	1½		6	5 0	4
										4	6 5	6
Barrack No. 24, south-east Tower.	25	100 mean	15	9	13,500	540	60	1½	7		4·5	4·5
Barrack No. 12, now used as School-room.	19	73	16	16 mean	18,688	983·58	61·474	1½	6		4·25	2·50
14 pendalls for Native Infantry.	67 men in each pendall, including native officers.	200	21	10·25 mean	43,050	642·538	62·687	No cots are provided for these men.				
Guard Rooms.									This is a barred opening.			
For Europeans - -	8	26	15	12	4,680	585	48¾	1½	1	3	3	
Quarter Guard Room for Natives.	20	28	21	11 mean	6,468	323⅔	29⅔	No cots provided for these men.	4	4·25	3	
Prison Cells.												
For Europeans, 4 rooms -	2	18 mean	8 mean	10	1,440	720	72	1½	1	1½	4	
For Natives, 1 room -	10	21	15	9 mean	2,835	283½	31½	No cots provided for these men.	2	2	3	

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides, opening from below, being attached above by hinges to the window frames. There are neither verandahs, jalousies, or jhilmils. 6. The cots used in barracks are of wood, with country bedding, cotton cloth, stuffed with straw, serge blankets, and country counterpanes and sheets. In the tents the beddings are on the ground. 7. This question having reference to the structure and dimensions of tents used in camp will be answered by the quartermaster-general's department at the army and division head-quarters. 8. Ventilation is effected in the barracks through the door and windows. These barracks are in the Castle, about 14 feet above the ground. The tents are ventilated by opening doors and walls; the huts through the doors, and the guard-rooms by doors and windows. The ventilation is quite sufficient. Punkahs are used for cooling the air in the barrack rooms, at a cost of about 12 rupees each, but as the allowance for pulling them is only 25 rupees a month, the full number allowed cannot be worked. 9. The barracks are composed of stone or brick masonry, the tents of Dungary cloth, and the huts of split bamboo walls and daubed with mud, &c. For further particulars see the plan transmitted. 10. Half the floor of the barracks on the south side of the Castle and the floor of the barracks in the south-east tower, as well as that of the barrack room, No. 12, are of chunam, and the floors of the remaining barracks are of teak planks. The floors of the native huts are of mud and are nine inches above the ground. All the barracks but one, No. 12 (now used as a school room, and whose floor is three feet above the ground) are on the first story, and from 13 to 20 feet above the general level of the ground. There is a free passage of air beneath the latter; but no ventilation through them. 11. There are no regular barracks for Europeans at this station. The room allowed for each man in the pendalls is not sufficient. The barracks are kept in repair by the engineer department, and the works are quickly executed. The fort adjutant, under the orders of the commanding officer, is responsible for the general sanitary condition of the camp. The walls and ceilings of the barracks are cleansed and limewashed twice a year generally, on requisition from the commanding officer of the station. 12. There are no regular washing places built for the men, but the eastern corner (ground floor) of the barracks on the south side of the Castle is used for that purpose. There are five tubs, and they are supplied daily with fresh water by bheesties. The drainage is carried out through the walls into the river. 13. A plan of the barrack cookhouses is transmitted. There are provided one set of copper cooking utensils for every 10 men, and they are tinned monthly. Water is supplied by bheesties. All the clothes are sent to the washermen. 14. A plan of the privies is transmitted. They are provided with iron pans, which are emptied by sweepers into the river; the urinals have a drain which discharges into the river direct. 15. Two lights burn in these buildings all night and two till tattoo. The ventilation is effected by several ventilators at the top of the roofs. 16. There are separate drains and sewers in each of the barracks to carry off to the river the dirty water, &c. The dimensions of these vary from 4 in. diameter (drains of round tiles) to 8 in. by 8 in. (brick and chunam sewers). The distance between the barracks and the river is from 100 to 350 feet. The drainage is sufficient, and no part of any building used as a barrack or hospital is damp. There are no cesspits or foul ditches. 17. All refuse matter is removed from the surface of the cantonment daily, and thrown into the river. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls or thick hedges, &c., interfering with the ventilation of the station or bazaar. 19. The drainage and ventilation of the bazaar are as good as possible. The water supply is obtained from wells about the camp. The bazaar is kept clean, and, to preserve this, is subject to the regulations as laid down in general orders. It is very small. No alterations to suggest. There are very few native houses near the station, and there are no dung-heaps or cesspits within them to cause any nuisance to the camp. When the wind blows over the native town it is considered unhealthy; when it blows from the north, it passes over a bank, which is laid bare at low water, and from which noxious vapours arise. The only quarter from which it blows, and is considered to be healthy, is from the south-west. 20. The animals for the use of the troops are slaughtered in the town about half a mile from the Castle, and no nuisance is experienced. 21. The bazaar is very small, and no horses are allowed in it. 22. There are no stables constructed at this station for artillery or cavalry horses, nor any picketing grounds arranged. 23. There are quarters at the station sufficient only for three married non-commissioned officers or men; married people do not occupy the barrack rooms with the men.
Officers' Quarters.	1. The officers' quarters in the Castle are very salubrious, but officers' lines in the camp are quite the reverse. The situation of the latter being bad, no improvement could be effected, except by building better houses, which nobody could afford. All the above questions under the head of Sanitary Conditions, unless otherwise specified, relate to the troops in the Castle.
IV. HEALTH OF THE TROOPS.	1. The station, surrounding district, and the adjoining native population, are generally unhealthy. 2. The diseases most prevalent among the native population are spleen disease, small-pox, and cholera. 3. The unhealthiness of the native population may be attributed to want of cleanliness, from the ruinous state of the town and the filthy habits of the natives, imperfect drainage, and the bank referred to before. 4. Detachment 4th Foot arrived here from Ahmedabad on the 28th December 1859. There were at that station 17 men for one year and eight months, and 38 men for ten months; they left it on the 21st December 1859. State of their health there very good, and on their arrival here they were healthy; but since then fever has been a

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	prevalent disease. The 16th Regiment Bombay Native Infantry were at Shikarpore for 13 months, and left that station on 20th January 1858, having suffered there from intermittent fever. Their state of health on their arrival here (26th February 1858) was very weakly, and they have suffered since their arrival from intermittent fever, diseases of the bowels, &c., &c. There is no part of the men's present accommodation at this station more unhealthy than another. 5. The troops are occasionally out in tents during an epidemic, and this is found to be very beneficial. 6. No medical officer here has been in charge of a hill station. 7. Troops at hill stations are less liable to fever and other diseases on return to the plains, which result is to be attributed to the improved state of their constitutions from residing on the hills. 8, 9. Hill stations are approved of for troops. Mount Aboo is the only one with which we are acquainted, and weak men on arrival there are liable to attacks of fever and diarrhœa. 10. Warm dry clothing, wholesome diet, regular exercise, and good shelter, are indispensable precautions to be observed for the men resident in hill stations. 11, 12. The period best adapted for a residence in the hills is from the beginning of March to the middle of July, or the first fall of rain. No experience to prove what period of residence would be injurious or beneficial to troops. 13. The ordinary protection from the sun must be observed for protecting the health of troops on leaving hill stations for the plains. 14. As a general rule it would be better to locate the troops in the hills with short service on the plains. Frequent change of station also would be decidedly beneficial. 15. No answer to this question. 16, 17. The elevation above the sea most suitable as a site for a hill station is about 4,000 feet. There is no higher ground near this station which could be advantageously occupied as a hill station. 18. Red sandy soil, with scant vegetation, is the best adapted for stations. The soil here is black loam, with a subsoil of clay, and is very unhealthy. 19. I consider the best age for soldiers to proceed to India to be from 19 to 27, and they should land here from about the middle of November to the beginning of January. I would recommend recruits on first landing in India to avoid intemperance and exposure to the sun. 20. With reference to Bombay, troops on landing should be immediately despatched to the high table land of the Deccan. 21. No experience as to the mode of transport of troops from the port to the interior. 22. The number of years a British soldier should serve in India is 10. 23, 24. No experience as to the manner of conducting medical boards, as regards invaliding. Invalids should leave India for home during the months of January and February.
Diseases.	1. There are regular inspection parades every Saturday morning for the discovery of incipient diseases at this station. 2, 3, 4, 5. There has been no case of scorbutic disease among the troops of this station, nor any of hepatitis amongst the Europeans, and only one with the natives, since the arrival of the regiment. Dracunculus is of rare occurrence here. The proportion of the constantly sick from venereal diseases to the total sick in hospital from all other diseases, is very small, both with Europeans and natives; but the establishment of lock hospitals would be beneficial. 6. The following are the diseases from which the troops, European and native, suffer, viz.— Fever.—Intermittent and common; remittent occasionally occur. Admissions - Europeans 70 - Natives 815 Deaths - ,, none - ,, 5 Dysentery.—No cases have occurred with Europeans, and with natives it is rare. Admissions - Europeans 1 - Natives 29 Deaths - ,, none - ,, 1 Cholera.—Only 1 case among the Europeans. Admissions - Europeans 1 - Natives 11 Deaths - ,, 1 - ,, 4 Small-pox.—Epidemic affections are rare. Admissions - Europeans none - Natives 5 Deaths - ,, ,, - ,, none. Rheumatism.—Is common among the natives; rare among Europeans. Admissions - Europeans 2 - Natives 70 Deaths - ,, none - ,, none. The proportion which admissions and deaths from these diseases bear to the total admissions and deaths is as follows:— Admissions - Europeans 74 - Natives 930 Deaths - ,, 1 - ,, 10 7. No answer can be returned to this query from want of experience. 8. Occupation and amusement are the most likely preventives of epidemic disease. 9. No doses of quinine have been given at this station as a prophylactic against malarial disease. 10. With regard to the preceding points, I would recommend a better system of drainage; but on account of the absence of good water, the station is not suitable for a camp.
V. Intemperance.	1, 2. The soldiers at this station are temperate, and there are no confirmed drunkards. There are no admissions into hospital from diseases occasioned either directly or indirectly from intemperance. There are no cases of drunkenness; but it would always be punished as an offence.

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	3. Soldiers are allowed to buy 2 drams of arrack, or 1 dram and 1 quart of porter at the canteen; there is no proper restriction in the bazaar. The spirits are good; they do not form any part of the soldier's ration, either at the station or on the march, it is not known if they do in the field. The men do not take a dram before morning parade. Malt liquor is given as a ration to convalescents in quantities varying from half a pint to a quart daily; but spirits are not. Nothing is allowed to be sold in the bazaar to Europeans, and nothing but arrack, porter, and beer are sold in the canteen. 4. The consumption of spirits is decidedly injurious to health; not so that of coffee and malt liquor. A moderate use of the former (spirit), however, is not injurious to Europeans. 5, 6. It would be advisable to abolish spirits as a ration, and substitute malt liquor in its stead. The same in respect to canteens. Malt liquor is recommended as being beneficial. 7. Coffee, tea, lemonade, soda water, &c., are not much used here. These articles are decidedly superior to spirits, but malt liquor in conjunction with them would be beneficial. 8, 9, 10. Beer, porter, tea, and coffee should be substituted for the spirit ration, and it would be beneficial to prohibit the sale of spirituous liquors in the canteens, and permit only beer, coffee, tea, lemonade, &c., to be sold to the troops. I have no other recommendations to make on these points. 11. The detachment here has no regular canteen.
VI. DIET.	1. The composition of the ration for Queen's British troops, and European troops in the Indian army, is as follows, viz.:—bread 1 lb., beef or mutton 1 lb., wood 3 lbs., onions 4 oz., potatoes or other vegetables $\frac{3}{4}$ lb., rice $\frac{1}{4}$ lb., salt 1 oz., tea (green) $\frac{5}{21}$ oz., and black $\frac{10}{21}$ oz., sugar $2\frac{1}{2}$ oz., 1 quart of porter, 1 dram of arrack, or 2 drams of arrack liquor paid for by the soldiers. There is an inspection of the constituents of this ration made every morning by an officer. 2. The rations provided for the troops are free of expense. The soldier has 3 meals a day, breakfast, dinner, and tea; nothing after that. 1 lb. of vegetables, which are varied according to the season, enters into the daily composition of the ration. 3. I have no improvement to suggest in the composition of the soldier's ration. An orderly corporal attends the issue, hands it over to the cooks, and sees it is not disposed of. 4. The usual copper cooking utensils are supplied to the detachment, and are found quite sufficient for the purpose. The kitchens are clean, well lighted, and well supplied with water; the food is cooked as the men wish it, is properly done, and sufficiently varied. No coffee is supplied to the men except on a march, when they have tea, coffee, or other refreshment half way. 5. Gardens could not be established at the station in consequence of the water being bad.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress and accoutrements consist of 1 cloth tunic, 1 pair cloth trousers, 3 pairs boots, 1 serge tunic, 1 pair serge trousers, 4 white and 2 blue shirts, 1 pair white trousers, 2 pairs blue trousers, 6 pairs socks, 2 khakee tunics, 2 pairs khakee trousers, 1 helmet, 1 forage cap, 2 flannel belts, 2 towels, 2 blacking brushes, and clothes brush, 1 small book, a comb, spoon, knife, fork, razor, soap brush, button brush, button stick, 1 piece of soap, 1 of pipe clay, 1 of sponge, a mess kettle with cover, knapsack and straps, 1 pair knee caps, 1 pair braces, 1 blacking box, 1 neck tie, 1 cotton bed, a blanket, a sheet, a rug, and 2 cap covers. I consider the present dress as suitable to the climate, and a great improvement on the old dress. For the hot weather a helmet and khakee are worn; for rainy weather, serge tunic and barrack change pantaloons and forage cap with covers; for cold weather full dress tunics and cloth pantaloons. The guard room is very badly ventilated, but the best available position for the guard is the Castle.
Duties.	1. No answer from want of experience. 2. The soldiers at this station parade every morning for an hour with arms and accoutrements, and in the evening for half an hour three days in the week setting up drill, roll call for the remainder. The men do not suffer in health from this. The times for parades, &c. should be so regulated as to avoid the sun as much as possible, and in the rains the men should not be exposed to the damp ground; the same rules should be observed in marching. The troops at this station average six nights in bed out of the week. 3. Each sentry is on duty eight hours out of the 24, and he is relieved every two hours, both day and night. The sentries are in the barracks. There are 7 roll calls day and night. 1st morning parade, 2nd breakfast, 3rd dinner, 4th evening meal, 5th parade, 6th half-past 7 o'clock, 7th tattoo. The men do not suffer from night guards.
VIII. INSTRUCTION AND RECREATION.	1, 2. The following are the means of instruction and recreation at the station. There is no ball court, but there is a skittle ground, and a school. There are neither library or reading room, day room, soldiers' clubs, soldiers' gardens, workshops, theatre, or gymnasia; in fact the means to keep the men occupied during the wet season or heat of the day are insufficient. In the hot weather the men are not allowed to go out after 8 o'clock in the morning till 5 in the afternoon, and in the cold weather till 4 in the afternoon. Establishing the above places for recreation, instruction, and amusement, I would suggest as a great desideratum. 3. Soldiers' savings' banks exist here, and are found advantageous. 4. There is not sufficient shade from trees, sheds, verandahs, or other means to enable the men to take exercise without injury to health during the day.
IX. MILITARY PRISONS.	1. The cells in the Castle have been condemned, and there are none in the camp.
X. FIELD SERVICE.	No information under this head, as the questions do not seem to apply to Surat.

References to Subjects and Queries.	Replies.
XI. Statistics of Sickness and Mortality.	The information under this head is given in the following table:—

SURAT.

European Troops.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1857–58	Detachment H.M.'s 86th Regt.	55	63	—	—	—	6	—	2	—	25	—	5	—	2	—	29	—	132	—	240·0	—
1858–59	2/11 Royal Artillery Detachment H.M.'s 83rd Regiment. Detachment H.M.'s 92nd Highlanders.	55	112	1	2	—	8	—	8	—	37	4	4	1	—	—	37	—	208	6	378·1	10·9
1859–60	Detachment 4th K.O. Regiment.	66	271	1	—	—	1	—	7	—	26	2	7	—	—	—	52	—	364	3	551·5	4·5

Native Troops.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850–51	15th Regiment Native Infantry. 29th Regiment Native Infantry.	793	406	2	3	—	1	—	4	—	93	10	10	2	15	4	248	1	780	19	98·3	2·3
1851–52	3rd Company 4th Battalion Artillery. 29th Regiment Native Infantry.	716	451	2	5	—	10	—	5	—	25	1	—	—	—	—	221	4	717	7	100·1	0·9
1852–53	2nd Company 3rd Battalion Artillery. 3rd Company 4th Battalion Artillery. 29th Regiment Native Infantry.	852	694	1	2	—	17	2	1	1	51	3	11	—	—	—	139	5	915	12	107·3	1·4
1853–54	2nd Company 3rd Battalion Artillery. L.W. 9th Regiment Native Infantry. 29th Regiment Native Infantry.	605	205	3	4	—	8	—	4	1	44	1	3	1	28	10	109	2	405	18	66·8	2·9
1854–55	2nd Company 3rd Battalion Artillery. 9th Regiment Native Infantry.	706	642	1	2	—	12	—	5	—	94	—	6	—	35	23	218	2	1,014	26	143·6	3·6
1855–56	2nd Company 3rd Battalion Artillery. 9th Regiment Native Infantry.	692	1,119	4	—	—	14	1	9	1	63	1	6	—	3	2	219	—	1,433	9	207·1	1·3
1856–57	2nd Company 3rd Battalion Artillery. 9th Regiment Native Infantry.	519	519	—	—	—	40	1	8	—	48	—	5	—	8	4	287	1	915	6	176·3	1·1
1857–58	1st Company 3rd Battalion Artillery. 2nd Company 3rd Battalion Artillery. 16th Regiment Native Infantry.	534	262	11	—	—	3	—	1	—	60	3	—	—	—	—	127	—	453	14	84·8	2·6
1858–59	16th Regiment Native Infantry. Detachment 9th Regiment Native Infantry.	998	1,295	13	7	—	33	2	3	—	206	2	6	—	—	—	623	2	2,173	19	217·7	1·9
1859–60	16th Regiment Native Infantry.	655	826	5	13	—	16	—	1	1	108	1	2	—	11	4	416	—	1,393	11	209·4	1·6

By order of the Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department,
Bombay, 22nd December 1860.

W. C. Coles, Assistant-Surgeon,
Secretary.

XII. Hospitals.

1. Plan of the hospital is transmitted.
2. The barracks and hospital are in the Castle and close to one another, and the native infantry hospital is a house formerly a private building. There are no stables. The Castle hospital is surrounded on three sides by the native town; but the native hospital is isolated from any building. Both hospitals are well ventilated, and there are no high walls or trees to interfere with the ventilation. The European hospital is not in a healthy position; the native is healthy enough, and free from nuisances.
3. The water supply is abundant, and as good as can be got in the neighbourhood.
4. There are several drains, and they are all cleansed daily by the sweepers, and in the native hospital the impurities are removed by sweepers. The river, which is the outlet for the sewage, is situated 30 yards from the Castle hospital and 130 yards from the native infantry hospital.

SURAT.
BOMBAY.

References to Subjects and Queries.	REPLIES.
XII Hospitals—*cont.*	5. The wards of the hospital in the Castle are 21 feet above the level of the ground, and they have a free perflation of air underneath the floors. The down-stair ward of the hospital for native infantry is two feet above the ground, and as it has a mud floor there is no free passage of air beneath it. The two upper wards are 14 feet above the ground, and they have a free perflation of air beneath. The roof water of the Castle hospital falls on a chunam terrace beneath, whence it is at once drained off into the river, and that of the hospital for native infantry falls on the ground around it; but most of it makes its way to the river, without sinking into the ground. There is no obstruction to the free surface drainage round both hospitals, the ground of the Castle hospital rain-fall having a natural slope, and a gutter is kept open during the monsoon for the proper drainage of the native infantry hospital. The walls of the Castle hospital are of brick and chunam masonry, the floors of chunam, and the windows are provided with Venetian and glass shutters, &c. See plans of this and the native infantry hospital transmitted. Verandahs are used in the native hospital, but there are none in the European; those in the former are used for the sick when required. The European hospital has an upper story, and the native infantry hospital has one also, but it cannot be used.

Table of hospital accommodation.

Date of construction unknown, as the European hospital is part of the Castle, which, as before mentioned, was constructed before the English took possession of Surat, and the native infantry hospital was formerly a private building.

Total number of wards, for Europeans, 2; for native infantry, 3.

Total regulation number of beds, for Europeans, 18; for native infantry, 24.

Wards or Hospital Huts. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
In the Castle.		Feet.	Feet.	Feet.			Feet.	Feet.		Feet.	Feet.
For European Troops - No. 15, 1	10	38	20	10	7,600	760	76	1½	8	6	4
	8	29	20	12	6,960	870	72½	1½	4	6	3·5
on the Cantonment. For Natives.											
Down-stair ward	12	46·25	21·5	13	12,926·87	1,077·24	82·86	1½	8	4·5	5, mud floor.
Ward on upper story.	6	23	21·5	12	5,934	989	82·42	1½	6	6·25	4·25

Both hospitals are placed so as to receive the full benefit of prevailing winds. The buildings at present occupied as hospitals were not constructed as such, but have been selected as the most suitable.

6. The ventilation is good in both hospitals. There are no jalousies or jhilmils.

7, 8. There are no means of cooling the air admitted into the wards, and none are required for warming it, it being hot enough already. The walls and ceilings of the hospital wards are cleansed and whitewashed every three months by Government general order.

9. There are no regular privies or urinals in the European hospital; night-stools are used and emptied by the sweepers. The native hospital has a range of privies near it, which are daily cleaned out. There are no cesspools, but the privies are highly offensive in consequence of imperfect cleansing.

10, 11. The lavatory arrangements in the hospitals consist of bath tubs in sufficient quantities, and the means of bathing the sick are convenient and sufficient.

12, 13. The washing and drying of the hospital linen are done by native washermen. The storage is sufficient and dry.

14. The bedsteads and bedding used in the hospital are the same as those in use in barracks.

15. The place used as a kitchen is a small dark apartment, insufficient for the object intended, but the best place that could be selected. The cooking pots are regularly tinned once a month, and the cooking of the diet is properly done.

16. The returns of the diet tables, diet rolls, &c. cannot be furnished by the European detachment, and the diet table is the same as will be furnished by the head-quarters of the regiment, as well as all other forms. The native hospital returns are transmitted. There are no diet tables in the native hospital.

17. For the European hospital a serjeant is allowed; and in all the other establishments are natives, as allowed by Government, consisting of two ward boys and a dresser for a detachment of that strength. For the native hospital an orderly is allowed, and men are selected to attend on the sick when required.

18. The sanitary condition of both hospitals is good, and there has been no outbreak of any epidemic disease.

19. The building of the European hospital is unfit for the accommodation of European patients. The native hospital is not sufficient for the accommodation of the regiment, and new hospitals should be erected in suitable situations.

20. There are no provisions made for the exercise of convalescents, either European or native; but the former may walk on the ramparts and the latter in front of the hospital.

21. There are no female wards, but the women are attended by the medical officers at their own quarters, which latter are badly ventilated. The buildings in the Castle do not admit of any improvement.

References to Subjects and Queries.	Replies.
XII. Hospitals—cont.	22. There are no special local hospital regulations in force at this station, not included in *the general presidency medical regulations.* *23. As regards the sanitary state of his hospital, repairs in buildings, change of diet, &c. the medical officer's suggestions are always attended to.* 24. There are no wards or hospital for convalescents, but such accommodation would be advantageous.
XIII. Burial of the Dead.	1, 2. The burial ground for British troops is two miles from the Castle, and about four miles from the camp, and cannot affect the sanitary condition of either. 3, 4. The grave space allowed is according to the size of the deceased. Graves are six feet deep, and have a six feet interval between each. [It is presumed that no answers are required to queries 2, relating to the area, subsoil, and drainage of burial ground, or 4, which relates to the state of the graveyard, and precautions to prevent nuisances.] 5. The dead of camp followers and bazaar people are buried or burnt, according to caste. 6, 7. No injury accrues to the public health from the present practice, and no improvements are suggested.

(Signed) Keith Jopp, Major,
Commanding the Garrison of Surat.
S. M. Pelly, Surgeon,
H. M. 16th Regiment, Bombay Native Infantry,
Senior Surgeon at Surat.
H. F. Hancock, Captain,
Acting Executive Engineer, Surat.

14th November 1860.

HYDERABAD, SINDE.

Accommodation.
- Queen's Troops.
  - Artillery, 2 Companies, { 11 Non-commissioned Officers. 155 Rank and File.
  - Infantry, 3 Companies, { 12 Non-commissioned Officers. 202 Rank and File.
- Native Troops.
  - Artillery, { Nos. 5 and 9, Light Field Battery, attached to the above 2 Companies; 7 Non-commissioned Officers, 111 Rank and File.
  - Infantry, 1 Regiment, { 48 Non-commissioned Officers. 642 Privates.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is undulating, sandy, and dry. There is a little wood on all sides. 2. The station is elevated 99·35 feet above the sea, and 40½ feet above the adjacent country. The nearest water is the river Indus, about three miles from cantonment, and some small nullahs, which are filled by the annual inundation of the river. There is no higher or healthier ground near the station. 3. The nearest mountain is about 20 miles from cantonment on the opposite side of the river Indus; it is elevated about 800 feet above the station. 4. Immediately below the plateau on which the cantonment of Hyderabad is, and close to the native infantry lines and officers' quarters, there is a sheet of water, but this only exists during the inundation. The vicinity is only liable to overflow during the inundation of the river Indus, which lasts about four months. There is some broken ground near the station, but it does not affect the health of the troops. 5. The station is freely exposed to the winds: the temperature is raised by the buildings being exposed to reflected sun-heat. Cold and variable winds affect the health of the station more or less. 6. The surrounding country is cultivated during the inundation. There are works of irrigation near the station, but not within cantonment limits. They have no effect on health. Indigo is not cultivated, nor the cultivation of hemp or flax carried on near the station; in fact all cultivation is prohibited within certain limits. 7. The native town of Hyderabad lies on the eastern side of the station, and adjoining it. 8. The district has a range of low calcareous hills running parallel to the river Indus at a distance of about three miles. On the northerly point of these hills stands the station of Hyderabad, having an elevation of about 40 feet above the adjacent country; with this exception the district consists of sandy plains and alluvial deposits from the river Indus. The soil is generally of extreme fertility if well watered, but if left uncared-for the surface soon turns to firm and drift sand. In many places the water is brackish, and throughout Sinde wells are maintained by very feeble springs. Most wells can be exhausted in 12 hours by a well-worked Persian wheel. The ground on which the camp stands was not previously occupied by population before the present station was formed on the plateau. 9. Water is usually found below the plateau at about 20 feet in the low season, and 15 feet in the high season. 10. The small annual fall of rain in Sinde does not affect the wells, but the rise and subsidence of the Indus does. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived principally from wells which are filled by the river Indus during the inundation. The water is stored in an open tank, the surface of which is about 80,000 square feet. The tank is full during the inundation, but almost dry during the months of May and June. There are neither plants nor animals in the tank, the water of which is not used for bathing purposes. The tank is not liable to pollution by leaves or other matter falling into it, neither does any nuisance or malaria proceed from it.

HYDERABAD, SINDE. BOMBAY.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	12. Some of the wells are brackish, but in the majority good water is found. A few during the hot weather become dirty and offensive from not being properly attended to; but in others, less used, purer water is at all seasons obtainable. The chemical composition of the water I do not know, but that in common use is soft in character, dissolving soap readily. Although I have never examined it microscopally, I have no doubt it swarms with animal life. The quality is undoubtedly good and wholesome, and the supply abundant. 13. Hydrabad is situated on the most northerly of a chain of low calcareous hills running north by east, between the rivers Indus and Fullailee; on a bare plateau of small extent at the foot of the hill on which the town is built, and to the westward of it are cantonments, and between this plateau and the river Indus, and on a lower level, there extends a thinly-wooded plain of an average breadth of three miles, part of which is flooded at certain seasons of the year by water from the river to the east of the town. Eastward of the town, between the elevation of the hill on which it is built and the banks of the Fullailee, there is a plain of nearly one mile average breadth, which has a greater elevation than that existing between the main river Indus and the hill. At a certain season of the year the water of the Fullailee is dammed and made available for the purposes of irrigation, at which time the bed of the river is almost dry, but at other times there is a large body of water, and it is then that the western plain between the cantonments and the Indus becomes flooded. I have not observed in one year's experience that malarious fever is more common among the troops of the station during the one period than the other; nor do I know whether the inhabitants of the houses in the town, which are situated near the river Fullailee, are more subject to fever and other diseases when the river becomes dry than at another time, or than those occupying houses at a greater distance; but the houses in the cantonments on the edge of the plateau overlooking the westward plain extending to the Indus, and which is periodically flooded, are considered unhealthy. 14. I am not aware what amount or kind of inquiry is gone through before new stations are selected.
II. CLIMATE.	1. Beyond a Fahrenheit's thermometer in use in every hospital, I am not aware of any meteorological instruments available at the station; an instrument to determine the amount of rain is easily made when required. 2. Table of Meteorological Observations for two years, from 1st Jan. 1856 to 31st Dec. 1857.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Cloud, Dew, Wind, Storms, &c.
Jan.	—	64·2	12·5	70·5	58·	64·2	56·	—	·55	N.E. & N.W.	Variable & Moderate.	—	Generally cloudy, rain on two occasions.
Feb.	—	71·2	15·8	77·8	62·	71·2	60·	102	·46	S.W., N.E. & N.	Moderate.	—	Cloudy in the early part, heavy with dews in morning, several dust storms, rain on occasions.
March	—	80·7	17·	89·	71·8	80·7	66·5	115	—	S.W. & W.	High.	—	Cloudy on 10 days, hot winds prevalent, dust storms prevail, and sometimes last three or four days.
April	—	86·5	16·7	93·9	77·6	86·5	72·	117	·62	S.W. 25.	High.	—	Two or three cloudy days with lightning in the evening, hot and sultry, several dust storms, on one occasion violent sandsquall, followed by thunder, lightning, and rain with hailstones.
May	—	91·	16·	99·	83·	91·	76·3	122	—	S.W.	High.	—	One or two cloudy days, hot winds blowing, with plenty of dust. Mornings and evenings cool.
June	—	92·2	14·1	99·3	85·2	92·2	79·	123	—	S.W.	Calms, High.	—	Several hot and sultry days in early part. Windy nights, dust storms frequent.
July	—	90·6	10·5	94·5	84·	90·6	81·	114	1·87	S.W. & W.	High.	—	Generally cloudy. One dust storm followed by thunder and heavy rain. Rain fell on 4 occasions.
Aug.	—	88·	10·4	92·6	82·2	88·	80·	108	14·79	S.W. & W.	More moderate.	—	Cloudy. Rain fell on 13 days in 1856.
Sept.	—	85·	9·3	89·5	80·2	85·	78·	104	2·07	S.W., W.N.W.	Moderate.	—	A few cloudy days before rain-fall. Violent sand squall followed by rain. Calm, sultry, cloudy weather common during this month.
Oct.	—	82·4	14·	89·5	75·5	82·4	73·	113	—	S.W. 23 N.E. 8.	Calm.	—	Dew in the nights and mornings common during this month. Days clear, and sun's rays scorching.
Nov.	—	72·5	15·	80·1	65·	72·5	61·2	103	—	N.E., N.W. & S.W.	Moderate.	-	Fine weather. Mornings and evenings cold.
Dec.	—	65·5	15·	73·	58·	65·5	57·	92	—	N.E.	Variable.	—	Early part clear fine weather, latter part cloudy accompanied by several slight dust storms.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. The atmosphere is exceedingly dry, even when heavy showers of rain fall about July and August. There is little moisture in the air, and evaporation goes on rapidly for seven months of the year, from the middle of March to the middle of October. The heat is extreme in these months, and during the day a hot breeze blows from the westward, and dust storms are frequent; but the nights and mornings are clear, cool, and refreshing, except in September and October, when all the 24 hours are disagreeably oppressive. In December and January, the weather is pleasant and bracing. In the cold season, morning fogs in the neighbourhood of the Indus are frequent; but they are altogether confined to the banks of the river. With regard to irrigation, the alternate flooding and drying of the land, which is its result, must, according to the ordinary theory, be a fertile source in the production of malaria; but I have no means of knowing whether malarious fever prevails to a greater extent in the district now than formerly. Dust storms, which are very frequent during the hot months, are local. I am not aware of any impure admixtures affecting the atmosphere over large areas of country; but I should imagine that at times malaria was pretty widely diffused. The depressing and exhausting tendency of the hot season has a decided influence in predisposing Europeans to disease, although I scarcely think that of itself it proves an exciting cause. Animal food cannot be procured of first-rate quality in the hottest weather, and from the short space of time in which it becomes bad, it is frequently eaten in a tough indigestible state. Bread, too, of good quality is made with great difficulty in the hot season; and the first description speedily gets sour. Protection from the sun is at all times necessary for the health of the troops, and sun-shades ought to be substantial and effective. The men on duty should not wear the same clothing at night as during the day, and the night clothing ought to be of woollen material. The most unhealthy months are at the changes of the seasons. On the approach of the hot weather, malarious fevers, with lassitude, debility, and chronic affections of the abdominal viscera prevail; while at the change from the hot to the cold, the same diseases of a more inflammatory type are common. 4. There is no district near this station, the climate of which is more conducive to health than that of Hydrabad. 5. Colonel Hough has served at the following stations: Mhow, Poona, Sholapore, Kuladgee, Belgaum, Bombay, Kirkee, Ahmedabad, Kurrachee, Gharra, Hyderabad, Sinde, Shikapore, Sukkur, and Dera Ghazee Khan. He considers that all are healthy, but that Mhow agrees best with his constitution. Captain Houghton has served in Rajcote, Kurrachee, Hyderabad, Sinde, Kolapore, Poona, Sattara, Belgaum, Sholapore, and Bombay, and considers them all healthy. Belgaum agrees best with his constitution.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station, surrounding country, and barracks are transmitted. 4. Table of barrack accommodation. Date of construction, 1854–55. Total number of rooms or huts, 10 blocks compose the European barracks. Total regulation number of non-commissioned officers and men, 1,000.

Barrack Rooms.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
10	96	172	24 + 12 + 12 = 48 (Mean.)	21½	177,504	1,849	86	About 1½ ft.	38	2	4
Guard Room -	6	26½	18½	20	9,805	1,634⅙	81¾	1½	4	3½	6½
Prison Cells -	1	10	10	16	1,600	1,600	100	—	2 1	2½ 2	2½ 1

5. The windows are on all sides. There are verandahs on four sides of the barracks 8½ feet wide; but they are never used as sleeping quarters for soldiers or others. There are also properly constructed jalousies.
6. The bedsteads and bedding, &c., are of the usual description used in all barracks.
7. The following are the dimensions of the tents for European soldiers, viz.:—

Double-poled tents - -	23	15	12	5⅔.
Single-poled tents - -	15⅔	15	11¼	5⅔.

The cubic space per man in the double-poled tents is 125 feet, and the superficial area is 14 feet.

8. The barracks, guard-room, &c., are ventilated by means of ventilators in the roof of the buildings. These are quite sufficient to keep the air pure by night as well as by day. The air admitted into the barrack-rooms is cooled by means of punkahs and tatties, well watered during two months.
9. The barracks are constructed of pucka brick and lime, with a roof of queen-post trusses, and tiled.
10. The floors are partly of pucka brick, and partly of stone, of an average height of 2½ feet above the ground; but with no ventilation at the bottom.
11. The barracks at this station are large and comfortably built of brick, with tile roofs. Though more durable, this material is far inferior to mud, as it is more easily heated, and retains the heat much longer. A great improvement, too, doubtless would be in having all the barracks upper-storied, or built on arches, in which case there would never be any inducement for the occupants to sleep in the open air, and from the well-known habit of malaria in keeping towards the surface of the earth, I have no doubt the cases of fever would be greatly diminished. The huts for the native troops are much too small, especially as regards the height of the walls. The tents are all that could be desired, consistent with portability. The barracks are generally cleansed and limewashed twice a year, or whenever they seem to

HYDERABAD, SINDE. BOMBAY.	References to Subjects and Queries.	REPLIES.
	III. Sanitary Condition of Station—*cont.*	require it; the hospital every quarter, or oftener if necessary. The drainage in the European lines is in every respect satisfactory, and the surface water, &c., is received into cesspits. Dampness is unknown in any house in the station. The cesspits are situated in the rear of each barrack, there being one to each. The dimensions are about 5 feet deep, by 4 feet 6 inches in diameter. They are so constructed of solid workmanship, that they can be thoroughly cleaned, which is done every night, the contents being carried in skins on bullock backs to a distance. The privies are cleansed twice a day by sweepers, and deodorising substances are occasionally used. There is no well within half a mile of them. In the native lines the cesspits are smaller, but more numerous, and in more convenient places close to the huts. They too are regularly cleaned twice a day, and the contents thrown about in the close vicinity of the cesspits; but as the cleaning is daily attended to, anything edible is immediately picked up by birds or dogs, and as evaporation is rapid, there is no nuisance. There is great room for reform in the privies attached to the lines of one of the native regiments. They are regularly cleaned by sweepers; but as all matter is deposited on the ground, the cleaning process cannot be efficiently performed, and the liquid substances are allowed to sink into the subsoil, so that the earth is thoroughly saturated, and a noisome odour constantly pervades the surrounding atmosphere. The other refuse of European and native lines is collected into heaps, and removed every morning by scavengers' carts, which carry it to some distance, where it is burnt. On the whole, the sanitary condition of the station is satisfactory. 12, 13, 14. Plans of the lavatories, the barrack cook-room, and the privies are transmitted. The linen is washed by native washermen, who are sufficient for the wants of the station. 15. The buildings are ventilated by openings in the roof of each block, and lighted by oil lamps. 16. The barracks are principally drained naturally with small gutters to carry off all water, &c. about five yards from the buildings. These means are sufficient. Neither the barrack or hospital is damp. The fluid refuse of the barracks is received into cesspits, which are about 500 yards from the nearest tank. There are no foul ditches near the station. 17. The surface cleansing of the cantonment is performed by men kept for the purpose by Government, under the superintendence of the staff officer. The filth is carried away in carts, and burnt in kilns kept for that purpose. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c. interfering with the ventilation of the station, bazaar, &c. 19. The drainage of the bazaar is principally natural. Water is bought by residents for their own use. There is no crowding in the bazaar, and it is always kept clean by sweepers, employed by Government for that purpose. The condition of the native houses near the station is good. There are no dung-heaps, &c. permitted within them. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. Animals for the use of the troops are slaughtered in the Sudder bazaar, about a mile from barracks. 21, 22. Horses are not picketed near the station, but those of the artillery occupy a picketing ground about 200 yards from the men's barracks in the open air, and about one mile from the hospital. 23. The married quarters for non-commissioned officers and men are quite sufficient. Married people do not occupy barrack-rooms with the men.
	Officers' Quarters.	1. There are no public quarters for officers at the station, they are all private.
	IV. HEALTH OF THE TROOPS.	1. The station and district are not by any means unhealthy, but when disease does occur a change is generally necessary for recovery. The adjoining native population too is healthy, but they are said to suffer severely from fever and vesical calculus, which latter disease is very common among them. 2. Small-pox and measles are epidemic occasionally here. Malarious fevers often associated with spleen disease prevail at all seasons, but chiefly in the autumn. Poverty and filth are the sources of many and varied diseases. 3. The alternate inundation and drying of the soil must be a fertile source of malaria. The simple habits of the people tend to preserve them in health, but total disregard for ventilation in their dwellings and poverty make a scorbutic tendency prevalent. 4. The men of the 3rd Company 1st Battalion Artillery have joined from Belgaum, Deesa, and Ahmednuggur. They were about five years at Belgaum, where they enjoyed excellent health. They left on 18th October 1858, and arrived here on 30th November 1858, in good health. Soon after arrival a number of cases of Guinea-worm occurred; but the men have been and are healthy, though cases of malarious fever, thermatic and hepatic affections do occasionally occur. The 1st Belooch Battalion Native Infantry had been on field service in Hindoostan for more than two years previous to their arrival at this station on 21st May 1859. During that period thermatic diseases and fevers prevailed, the latter less frequent than since their arrival here, but the cases more severe. A great number of men were then always returned as sick from being foot sore, which is not to be wondered at, as they march in ammunition boots, without stockings. But, strictly speaking, the regiment was healthy. Since arrival here, cases of malarious fever have predominated, and rheumatic affections, chiefly of a syphilitic origin, while cases of dysentery and intractable ulcers are common. Were the habits of Belooches less debauched and more cleanly, the health of the regiment would be perfect. There is no portion of the barracks nor of the native lines more unhealthy than another. 5. The artillery are camped out once a year for a month or so for practice, without detriment to their health. 6, 7. No experience of hill stations. 8. I approve of hill stations for troops. The higher the situation of any station in India, within a certain range, undoubtedly the healthier and more agreeable it is. 9. There are no diseases peculiar to hill stations with which troops are liable to be attacked on going to them. 10. Wholesome diet, with a moderate allowance of stimulants, woollen clothing next the skin (especially at night), shelter from the sun's rays, light duties, and active inspiriting exercises are conducive to health in hill and all other stations.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	11. The seasons best adapted for a residence in the hills depends on the locality, and the period of residence required in order to receive benefit, on the nature and stage of the disease. 12. The longer an invalid resides in a climate adapted to the cure of his disease and favourable to his constitution, the more robust he will become, and the better able to serve in the plains. Acclimatation is a myth, as generally understood. Habits and customs suitable to the place of residence only require to be adopted. 13. Every possible precaution to prevent excesses of any kind, and more particularly exposure to the sun, is required to protect the health of troops on leaving hill stations for the plains. 14. European troops generally are fond of change of station. It is certainly not advisable to keep them long in unhealthy districts; and for these I should strongly advocate frequent reliefs. But, unless an epidemic be raging, the stations of native troops ought to be changed as seldom as possible. 15. No reply to this query. 16. The elevation above the sea most suitable for hill stations is about 5,000 feet. 17. Some of the hills surrounding the station have been proposed as sites for sanitaria, but difficulty of access and want of water render the carrying out of such a project impracticable, except at an enormous expense. 18. No experience of hill stations. 19. The best age for a soldier to proceed to India is from 20 to 22 years, when growth and development of the system have well advanced, and they should land here early in November. On landing they should be moved to a healthy district near the port of disembarkation and out of the way of all temptations. No fatiguing duties or drill should be imposed on them, nor should a long march be entered upon. Good sun hats and suitable clothing of woollen texture should be supplied at home and served out for use as soon as the troops come into a warm latitude. Cloth clothing of every description should be entirely abolished in the plains of India. 20. Troops should be sent direct from the home depôts to India. The mortality of the first years of service could, I think, be considerably diminished by a more careful selection of the men at home, by sending no man to India until he has learned obedience, and been fully initiated into all the duties of a soldier, by visiting with severe punishment any transgression of rules on first arrival here, and favouring all sorts of amusement and recreation to keep the men contented and happy. On march the distance should not exceed 10 or 12 miles a day. Coffee before the march should never be omitted. 21. No transport of troops takes place from this station. 22. A British soldier may serve as long in India as in any other part of the world. Two-thirds of Indian stations are as healthy as any in Europe, provided the habits be adapted to the country. 23. Medical boards are absurdities. Every medical man, if imbued with a kindly feeling, considers it necessary if at all consistent with his views to uphold the opinion of a brother in the profession. The opinion of one honourable, upright, and well-qualified medical officer is of more value than those of a thousand boards. 24. Invalids proceeding home should leave India about March, or so as to arrive in England at a genial season of the year.
Diseases.	1. There are no inspection parades here for the discovery of incipient diseases, nor are they necessary. 2. The European troops at this station have no tendency to scorbutic disease, nor will they have so long as they are so well dieted as at present. Among the native troops it does not prevail to a great extent, but cases frequently occur, generally in men who have large families, or in those who waste their money and live poorly. Among the rural population the disease is common, but the cases are not extreme. 3. In a company of European artillerymen (average strength 74), there have been only seven admissions from hepatic disease during late years, but I know that other cases have occurred associated with other diseases under which they have been classed. In most cases there is no doubt that free living and indolent habits induce the disease, but in others it is difficult to assign any origin. Everything that contributes to sobriety and activity, both of body and mind, must have a good effect in diminishing this disease. Among natives acute affections of the liver are not common, whereas chronic enlargement is not rare. 4. Just after arrival here a number of cases of dracunculus occurred in the men of the 3d Company 1st Battalion of Artillery, but since then not a man has suffered from it, nor have I ever seen a case here in a native. No precautions to suggest. 5. Among the artillerymen a very small proportion of venereal disease is ever under treatment, frequently not a case; but among the natives more than half the sickness of the regiment is more or less attributable to this disease. So far as European troops are concerned it is scarcely necessary to establish a lock hospital, and I am doubtful if one would have much effect in diminishing the frequency of this disease among the sepoys. 6. The troops at this station suffer from diseases chiefly of the endemic class; quotidian, intermittent, and remittent fevers are the most common; and the tertian and quartan types are not rare. Among the troops during the last twelve months there occurred the following diseases and deaths :—

Europeans, Strength, 74.	Dysentery, 5 cases.	No deaths.
	Fevers, 17 cases.	1 death.
	Rheumatism, 16 cases.	No death.
	No case of small-pox.	
	Ditto cholera.	
Natives, Average Strength, 887.	Fevers, 159 cases.	No death.
	Dysentery, 21 cases.	2 deaths.
	Rheumatism, 65 cases.	No death.
	Small-pox, 1 case.	No cholera.

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References to Subjects and Queries.	REPLIES.
IV. Health of Troops—*Diseases—cont.*	7. Cases of zymotic diseases have not prevailed here for a long time. There are always sporadic cases of small-pox, &c. in the town. These diseases are most prevalent in the autumn, when a muggy heavy atmosphere prevails, and breezes are less frequent than at other times. No particular locality has been distinguished as prolific of zymotic diseases. A native of India is a most extraordinary animal, who builds walls and partitions in his habitation and obstructs ventilation, while at the same time he makes receptacles for filth, and these habits greatly foster the above diseases. 8. No epidemic disease has prevailed here for some time. 9. Small doses of quinine have not been given on a large scale as a prophylactic against malarious diseases here. 10. Strict attention to all sanitary matters should be paid in order to prevent or mitigate epidemic disease. No overcrowding of barracks. Making more commodious and extended the accommodation of native troops, more especially as regards the height of the walls of tents; and above all, removing dilapidated houses and putting a stop to the overcrowding of buildings, characteristic of every native town.
V. INTEMPERANCE.	1. The soldiers at this station are temperate, and there are very few confirmed drunkards in the artillery. 2. Drunkenness is always punished as an offence. 3. Distilled spirits are sold both at the canteen and bazaar, and are good in the former but very bad in the latter. A cunning man may procure any amount. Spirit is supplied on payment at the station, on the march, and in the field. The dram before morning parade depends upon the will of the commanding officer. As regards the health of the men it is quite unnecessary. The smallest or largest quantities imaginable of spirits may be given to convalescents, at the discretion of the medical officer. Filthy lemonade, &c., not tending to promote digestion, are sold in the bazaar. 4. The consumption of spirits by troops can be done without, and certainly is not conducive to internal discipline. 5. I would recommend Government to abolish the spirit ration, restrict the sale in the canteens, and prohibit it altogether in the bazaar. 6. Malt liquors and wines are not so deleterious as spirits. 7. Coffee, tea, lemonade, &c. are used at this station, and are not nearly so detrimental as spirits or malt liquor. 8, 9. It would be beneficial to suppress the spirit ration altogether, except in the case of convalescents, at the discretion of the medical officer. 10. I would punish severely every case of drunkenness, and give every inducement to the men to abstain, by providing them with varied sources of amusement and recreation. 11. No reply to this query.
VI. DIET.	1. The soldier's ration at this station is as follows:—Beef or mutton, first sort, 1 lb.; fine white wheaten bread, first sort, 1 lb.; vegetables of sorts, half of which are potatoes, 1 lb.; rice, 4 oz.; tea, $\frac{10}{21}$ oz. black, and $\frac{5}{21}$ oz. green; (or coffee, $\frac{1}{7}$ oz.); salt, 1 oz.; sugar, $2\frac{1}{2}$ oz.; and wood, given free, 3 lbs. Beef is the usual meat ration, but where good mutton is procurable it is given twice a week. Potatoes sometimes cannot be had. The rations are inspected by the orderly officer every day before issue, and by the commanding officer once a week, or oftener. 2. A complete ration is provided for the troops, and the stoppage, or rather the money a man gets if he does not draw his ration, as in the case of a married man, is 3 annas 4 pice daily. When the ration does not cost Government this amount, the surplus is given to the soldier. The soldier has three meals a day; viz., breakfast at 8 a.m., of meat, bread, and tea or coffee; dinner at 1 p.m., meat, vegetables, bread, and a pint of porter to those who choose to purchase and bring it from the canteen; and tea, a little before 5 p.m., consisting of bread and tea. Such men as choose to do so can purchase a meat supper and coffee in the coffee shop. 3. I do not think the men make away with any part of their ration, excepting the rice, which is sometimes changed for milk, butter, eggs, and pepper. The rations are excellent. 4. The cooking is done by hired cooks, generally Portuguese. There are three to a company; a master-cook and two mates. The cooking utensils are of copper, tinned once a month, and consist of stewpans, fryingpans, large tea kettles, and camp kettles. The cook-houses are detached from the main buildings, and are well suited to natives but not to Europeans. The floors are of stone; and everything about the kitchens is inspected daily by the orderly officer. The cooking is very good; and tea and coffee are properly prepared. The variety in the cooking is according to the fancy of the mess, and is very considerable. On the line of march the men can always have a cup of coffee from the coffee shop on payment. 5. It would be impossible to establish gardens for soldiers here, there being no water near the barracks.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements at this station are of the description usual in India, and suitable to the climate. Khakee cotton clothing is the most excellent dress ever devised for hot weather in India. The guard dress here is, from March to November, khakee cotton clothing and wicker helmet in the day time; forage cap at night; and from November to March, cloth shell jacket, serge trousers, and forage cap, without cover. The sentries are protected from sun and wet by a broad verandah.
Duties.	1. As far as the health of the men is concerned, I think it is advisable they should be drilled in India; for by the way in which he lives during the first year of a man's life in India, his habits in the country are in a great measure formed. It is remarkable how much more healthy a recruit is at drill than an old soldier who has come out instructed. The recruit's time is fully occupied, and by the time he has passed his drill he has had sufficient experience of the climate to make him careful.

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements and Duties—*Duties—cont.*	2. An artillery soldier has to turn out at daylight, and five times a week attend drill, which lasts one hour, three-quarters of an hour, or half an hour, according to the drill, and the season. I have never known a man suffer in health from this. Guards come round to a man once in seven days. The men have usually six nights in bed in the week, when we are up to our full strength. 3. All our guards mount within 100 yards of the barracks, and last for 24 hours. A picquet lasts from sunset till daylight next morning, and each sentry mounts for two hours. There is a morning roll call at parade hour, and one half an hour after daylight, a tattoo roll call, and the last roll call at night. There are also short roll calls, as they are termed, for men without good-conduct badges. Night guard is the most trying part of a soldier's duty in cantonment; but I think all the precautions that can be taken to make it as little detrimental to health as possible are already taken.
VIII. Instruction and Recreation.	1. The following are the means of instruction and recreation as this station:—A ball court, a skittle ground, a school, with a good schoolmaster, a library, and reading-room, much too small, and insufficiently lighted, the lights being paid for by the men. We have a cricket club, and the men also play a good deal at a game called long bullets. The men have in the hot weather (save those who can read) positively nothing to do. There is no restriction to exposure to the sun, and I have always found the men less anxious to expose themselves when there is no such restriction. 2. I would recommend the establishment of large airy workshops at the station, and am confident they would prove a boon to the soldier. Were arsenal, commissariat, and engineering officers instructed to give as much work to the men as they would undertake, I think they would get the work better, and as cheaply done as at present, while it would be a great boon to the soldier, by occupying his time and by enabling him to feel he was doing good. A good reading room, well lighted at night, is a great want, and a more suitable supply of books. A money allowance to be made for this. All manly games should also be encouraged. 3. We have savings' banks for soldiers already established here. They answer admirably. 4. There are no trees near barracks, but the men can walk about in the north verandahs, without exposure, if that can be called exercise.
IX. Military Prisons.	There is no crowding in the military prisons at this station, and the ventilation is good.
X. Field Service.	1. There are no special local regulations for field medical service not included in the General Presidency Regulations. 2. The practical working of medical officers on the line of march consists in attendance on the sick, and in procuring a sufficient supply of carriage. Medical officers are at liberty to offer an opinion on the salubrity or otherwise of the ground selected for bivouacking or encamping; but it depends altogether on the officer commanding, whether the medical officer's suggestions are attended to. 3. The selection of encamping grounds, and general camp regulations, rests with the commanding officer and his staff, the medical officer exercising a careful supervision over the salubrity of the situation, effects of the water, &c. 4. The selection for field hospitals depends on the country or locality in which operations are being conducted. The transport of sick generally consists of doolies, spring carts, and stretchers; the latter formed of two bamboo poles, with strong canvas in the centre. Regulations bearing on these matters are to be found in the Medical Code.
XI. Statistics of Sickness and Mortality.	HYDERABAD.

EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Disease of the Liver. Treated.	Disease of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	QUEEN'S TROOPS.																					
1850-51	L. W. H.M.'s 8th Regiment - - - R. W. „ 64th Do.	523	303	1	—	—	13	—	51	—	90	—	13	—	—	—	367	—	837	1	160·0	0·1
1851-52	Wing „ 64th Do.	446	322	10	—	—	23	—	40	—	144	5	15	1	—	—	379	1	932	17	208·9	3·8
1852-53	R. W. „ 64th Do. / R. W. „ 83rd Do.	443	1,542	28	—	—	15	—	17	—	79	1	21	3	—	—	198	1	1,872	33	422·5	7·4
1853-54	R. W. „ 83rd Do. / R. W. „ 86th Do.	370	316	—	—	—	18	3	6	—	50	1	11	2	—	—	185	—	586	6	158·3	1·6
1854-55	R. W. „ 86th Do.	249	143	—	—	—	17	—	29	1	135	1	9	1	—	—	226	1	559	4	224·4	1·6
1858-59	Detachment 46th Do. / Detachment 51st Do.	125	50	—	—	—	21	—	6	—	45	1	3	—	—	—	122	—	247	1	197·6	0·8
1859-60	Detachment 64th Do.	139	28	—	—	—	7	—	12	2	20	1	9	—	—	—	129	—	177	3	127·3	2·1
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
1851-52	1st Troop Horse Brigade	23	3	—	—	—	—	—	1	—	6	—	4	—	—	—	25	—	39	—	169·5	—
1854-55	2nd European Regiment Light Infantry - -	170	32	—	—	—	8	1	14	1	23	—	12	—	—	—	109	—	198	2	116·4	1·1
1855-56	4th Troop Horse Brigade / 4th Company 1st Battalion Artillery - - / 2nd European Regiment Light Infantry -	905	530	5	—	—	61	3	50	2	218	4	115	5	—	—	693	3	1,667	22	184·1	2·4
1856-57	2nd Do. Do. -	520	1,267	11	—	—	51	2	14	—	127	9	68	7	—	—	419	—	1,946	29	374·2	5·5
1857-58	3rd Troop Horse Brigade / 4th Company 1st Battalion Artillery - -	52	76	—	—	—	5	1	4	1	12	2	2	—	—	—	54	—	153	4	294·2	7·6
1858-59	3rd Company 1st Do. Do. / 4th Company 1st Do. Do.	85	52	—	—	—	3	—	8	—	17	1	6	—	—	—	87	—	173	1	203·5	1·1
1859-60	3rd Company 1st Do. Do. / Detachment 1st European Regiment Fusiliers - - -	131	42	1	—	—	14	1	13	—	34	—	6	—	—	—	147	1	256	3	195·4	2·3

HYDERABAD, SINDE. BOMBAY.

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1850-51	2nd Company 4th Battalion Artillery - - 28th Regiment Native Infantry - - 29th Do. Do. - 2nd Belooch Battalion -	1,968	1,005	7	1	—	40	2	7	—	122	2	17	1	2	—	1,170	2	2,364	14	120·1	0·7
1851-52	2nd Company 4th Battalion Artillery - 1st Belooch Battalion - 2nd Do. - 1st Grenadier Regiment Native Infantry - 28th Regiment Native Infantry -	2,587	1,205	7	29	—	47	1	7	—	260	7	28	3	19	9	1,503	10	3,098	37	119·7	1·4
1852-53	4th Company 3rd Battalion Artillery - 2nd Company 4th Do. - 6th Regiment Native Infantry - - 28th Do. - 1st Belooch Battalion -	1,751	2,838	16	—	—	62	3	9	1	159	9	18	—	—	—	863	1	3,949	30	225·5	1·7
1853-54	4th Company 3rd Battalion Artillery - 6th Regiment Native Infantry - - 1st Belooch Battalion -	1,880	977	4	4	—	43	4	4	—	129	5	19	1	—	—	672	12	1,848	26	98·2	1·3
1854-55	4th Company 3rd Battalion Artillery - 6th Regiment Native Infantry - - 1st Belooch Battalion -	1,855	749	3	31	4	33	4	—	—	111	2	14	—	—	—	719	4	1,657	17	89·3	0·9
1855-56	5th Company 4th Battalion Artillery - 6th Regiment Native Infantry - - 13th Do. - 1st Belooch Battalion -	1,417	880	3	24	—	55	3	2	1	205	2	6	—	—	—	803	5	1,975	14	139·3	0·9
1856-57	5th Company 4th Battalion Artillery - 13th Regiment Native Infantry - - 2nd Belooch Battalion -	1,199	1,460	4	23	—	85	2	5	—	146	2	9	—	—	—	547	—	2,275	8	189·7	0·6
1857-58	13th Regiment Native Infantry -	692	536	2	15	—	27	1	2	—	44	—	13	1	—	—	363	—	1,000	4	144·5	0·5
1858-59	3rd Belooch Battalion -	777	217	1	—	—	142	4	1	—	83	—	8	—	—	—	541	1	992	6	127·6	0·7
1859-60	1st Do. - Wing 3rd Do. -	1,039	234	1	2	—	43	1	1	—	89	2	18	—	—	—	788	3	1,175	7	113·0	0·6

WOMEN AND CHILDREN.

Years.	CORPS.	WOMEN. Strength. Europeans.	WOMEN. Strength. Indo-Europeans and Natives.	WOMEN. Strength. Total.	WOMEN. Treated. Europeans.	WOMEN. Treated. Indo-Europeans and Natives.	WOMEN. Died. Europeans.	WOMEN. Died. Indo-Europeans.	WOMEN. Ratio per Cent. to Strength. Treated.	WOMEN. Ratio per Cent. to Strength. Died.	CHILDREN. Strength. Europeans.	CHILDREN. Strength. Indo-Europeans and Natives.	CHILDREN. Strength. Total.	CHILDREN. Treated. Europeans.	CHILDREN. Treated. Indo-Europeans and Natives.	CHILDREN. Died. Europeans.	CHILDREN. Died. Indo-Europeans and Natives.	CHILDREN. Ratio per Cent. to Strength. Treated.	CHILDREN. Ratio per Cent. to Strength. Died.
1853-54	Wing H.M.'s 83rd Regiment - -	51	—	51	65	—	2	—	106·5	3·2	77	—	77	57	—	1	—	74·0	1·3
1859-60	Detachment H.M.'s 64th Do. - - -	9	1	10	13	1	—	—	140·0	—	15	2	17	6	—	—	—	35·2	—
1854-55	2nd Bombay European Regiment Light Infantry - - -	45	4	49	54	4	2	—	118·3	4·0	67	4	71	50	1	7	—	71·8	9·8
1855-56	Do. Do. -	52	4	56	49	4	2	—	94·6	3·5	70	7	77	41	6	2	—	61·0	2·5
1859-60	3rd Company 1st Battalion Artillery - -	9	4	13	13	6	—	—	146·1	—	26	9	35	27	4	1	1	88·5	5·7

By order of the Principal Inspector-General Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1861.

W. C. COLES,
Assistant Surgeon, Secretary.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. A plan of the hospital is transmitted. 2. Its distance from the barracks is 600 yards in rear, and its position as regards the Sudder bazaar is north-west, as also of the native town. The site is open, healthy, and in no way obstructed. 3. The water is wholesome, and the supply abundant. 4. Refuse water and other impurities are carried away by open drains, discharging into cess-pools, which are regularly cleaned out. 5. The wards are raised three feet above the ground, but there is no perflation of air beneath them. Provision is made for carrying away the roof water; the whole of it does not sink into the subsoil. There is an open drain all round the hospital, which carries away the rain-fall rapidly. The hospital is built of pucka brick and lime, with a tiled roof, having a false verandah, which is intended to keep the wards cool. The hospital is supplied with double verandahs in front and rear, and single ones on the sides. They afford sufficient shelter from the sun's rays, but are not used for the accommodation of sick, convalescents, or others.

References to Subjects and Queries.	Replies.

XII. Hospitals—*cont.*

Table of Hospital Accommodation.
Date of construction, 1854–55.
Total number of wards, 5.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.			
		Length.	Breadth.	Height.	Cubic Contents.
		Feet.	Feet.	Mean.	
No. 1	—	222	24	28	149,184
„ 2	—	43	24	28	28,896
„ 3	—	77	24	28	57,744
„ 4	—	97	24	28	65,184
„ 5	—	45	16	18	12,960

The hospital is so placed as to receive the full benefit of prevailing winds. There are no windows to the hospital, but doors, the construction of which is conducive to ventilation and coolness.

6. There are sufficient ventilators, with Venetian shutters, to keep the wards cool and free of odour.
7. During the hot season the air is cooled by passing through kus-kus, tatties, placed opposite the doors and kept constantly wet with water. The wards are well supplied with punkahs.
8. There are no means for warming the air admitted to the hospital. The walls and ceilings of the wards are cleansed and limewashed yearly, or oftener if thought desirable by the medical officer.
9. The privies are situated on the northern and southern extremities of the hospital, and constructed of pucka brick and lime, with flat roofs. They are placed on cesspools, which are carefully cleansed, and deodorizing substances are made use of. They are not offensive.
10, 11. There are no lavatory arrangements for the sick in hospital other than a tub or hip bath, which is neither sufficient nor convenient.
12. The linen of the hospital is washed, and dried by being exposed to the sun, which is quite sufficient.
13. The storage is sufficient and dry.
14. The cots are made of wood, standing about 2½ feet high. The part on which the bedding rests consists of broad tape lashed from the side and end pieces of wood, and is occasionally undone and washed. The beds are stuffed with chopped straw, which is from time to time renewed.
15. The position of the kitchen is east of the ward. The cooking utensils are of copper, tinned over, and the means are sufficient.
16. Diet tables, rolls, and other returns are given in the Medical Code of Regulations since January 1861.
17. Ward boys are allowed by Government for attendance on the sick, and a comrade can always be procured, or a nurse on the requisition of the medical officer. This establishment differs according to the strength of the corps or detachment.
18. The sanitary condition of the European hospital is good, and no epidemic, as far as I know, has prevailed in it.
19. The storehouses and apothecary's quarters are situated too near to and in wrong position as regards the hospital.
20. There is no ground or walk for convalescents. An unweildy and uncomfortable cart is allowed by Government to each corps or detachment of the sick for the exercise of convalescents, but it is taken little advantage of by the men.
21. There is a small female hospital, and a matron for each corps or detachment; but in an unhealthy season the accommodation would be deficient.
22. There are no special local hospital regulations not included in the General Presidency Medical Regulations.
23. The medical officer can of course prescribe diet and medical comforts as he thinks fit, but any extraordinary expenditure is subject to the sanction of the Deputy Inspector General; and the same with regard to repairs or alterations.
24. There is no hospital or ward for convalescents, nor is any such required.

XIII. Burial of the Dead.

1. The burial ground for British troops is about one mile from and to the north-east of the station. The prevailing wind, with regard to the station, is generally from south-west or north-east.
2. The area of the ground is about 200 square yards, and its soil is sandy. There is no drainage, and decomposition takes place rapidly. The ground is surrounded by high walls so as to render it perfectly secure.
3. There is no specified grave space, but there is usually an interval of 3 or 4 yards allowed between the graves, which are usually about 7 or 8 feet deep, and are never re-opened. Interment, as a general rule, takes place 12 hours after death.
4. The graveyard is never offensive. Whenever a man dies, if it be any time before 2 or 3 in the day, the funeral takes place next morning, with all the usual ceremonies.
5. The dead of bazaar people are buried or burnt, according to caste.
6, 7. No injury accrues to the public health from the present practice, nor are any improvements to be suggested.

(Signed) L. S. Hough, Lieut.-Col., Commanding Hyderabad.
W. R. Houghton, Captain,
Staff Officer, and Officiating Executive Engineer.
C. Gordon Asher, M.D., Assistant Surgeon,
Civil Surgeon, Hyderabad.

20th February 1861.

Examined by A. F. Cunynghame, Major-General,
Commanding in Sinde.

KURRACHEE.
BOMBAY.

KURRACHEE.

Accommodation
- Queen's Troops
  - Artillery, 1 Troop, Horse, complete.
  - Infantry, 1 Regiment of Her Majesty's Service, complete.
  - Infantry Barracks, (Queen's Depôt) for 423 men.
- Native Troops
  - Artillery, 1 Company, Golundaze (Native Artillery).
  - Infantry, 2 Regiments.
  - Infantry, Sappers and Miners, Lines for 1½ Companies.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station consists of a sandy valley, the dry bed of a river being in the lowest part, with belt of trees and cultivation; the ground is sloping, and, in the distance, sandy hills. An inland salt-water swamp 5½ miles square approaches within a quarter of a mile of the cantonments, and lies between them and the sea, which is 3 or 4 miles distant on the south-west margin of the valley. This point is the inlet of the swamp, which is here about a quarter of a mile broad. In the lowest part of the valley there is the belt of trees, which is, however, not very extensive, and also some cultivation.
	2. The elevation of the station above the sea is about 27 feet, but somewhat lower than the adjacent country, except towards the river Lyaree and the sea. The dry bed of the former, which is about half a mile distant, is 16 feet below the station, and the salt-water swamp is about 20 feet below the level. Clifton and Manora point, at the entrance of the harbour, are higher and probably healthier than the station. The former is 2½ miles and the latter 6 miles from the cantonments, and their elevation above the sea is about 100 feet, and 70 feet above the station. Both are occupied, but are too limited for military purposes.
	3. A low mountain chain, running westward to the sea and rising to an elevation of about 800 feet, is situated about 6 miles distant from the station on the north and north-west aspect.
	4. The sea is distant about 3 miles. The bed of the river Lyaree, which is usually dry, is about half a mile from the station. When rain falls the bed is then filled with water, but this is very seldom. Wells are, however, pretty numerous in the lower part of the valley: There are also a few open tanks, but these are often dry. The vicinity of the station is not liable to overflow. No broken ground, ravines, or water pits exist near worthy of notice.
	5. The station is open and well ventilated, and from the usually strong winds that blow any elevation of temperature by the exposure of the buildings to reflected sun heat must be inconsiderable. The station is not exposed to cold and variable winds. Land and sea breezes prevail in spring and autumn, but with no particularly marked effects on health.
	6. The surrounding country is uncultivated except on the eastern bank of the river Lyaree. No works of irrigation exist. There is no cultivation of rice or indigo, nor is the preparation of hemp or flax carried on near the station.
	7. The town of Kurrachee is distant 2½ miles from the station, and contains a population of 22,000.
	8. The ridges of the amphitheatre are mostly limestone, abounding in fossils, the lower hills being composed some of sandstone and some conglomerate. Below is blue clay, resting on the sand and conglomerate of the miocene period. The surface on the more level parts is alluvial, clayey, and in some parts gravelly, the subsoil being clay, sand, and gravel. The station occupies new ground.
	9. Water is found at about 12 to 20 feet below the surface during the dry season, and in the bed of the river at 2 feet. Rain feldom falls, and when it does it soon flows off.
	10. There are no surface springs, and the drainage from higher ground mostly runs off, and the surface dries immediately.
	11. The water supply is derived from wells. There are 2 or 3 tanks, but their extent of surface is inconsiderable. Being dependent on the rain-fall they are seldom full, generally being quite dry. There is nothing conspicuous in the nature of the plants or animals they contain. No tank used for drinking purposes is also used for bathing, nor are they liable to pollution from any source. No nuisance or malaria proceeds from any tank within or without the station.
	12. There is no lack of water in the wells, the supply never having been known to fail, and some wells would yield a larger quantity. The water is rather dull in colour, and has an earthy taste, but is without smell. It contains chloride of sodium, sulphate of soda, sulphate of lime, sulphate of magnesia, carbonate of lime, and carbonate of magnesia, and the best wells contain nearly one two-thousandth part of saline matter. The quality is not good, and it is injurious to health; the quantity, however, as before stated, is not defective. It is raised by Persian wheels and hand buckets, and distributed by water carriers in skins and by casks in carts. Water should be brought from the Mulleer river, about 11 miles distant, or from the Indus.
	13. In the salt swamp adjacent, which covers an area of 5 square miles, all the conditions necessary to the production of mephitism exist.
	14. With regard to the selection of sites for stations, it is believed that no particular rule exists, but there is a rule in reference to the selection of sites for new buildings, especially barracks, pendalls, and hospitals. The committee of selection, consisting generally of the officer commanding the station, an engineer officer, assistant quartermaster-general, and a medical officer appointed for the latter purpose might also determine the sites for stations.
II. Climate.	1. The means and instruments available at the station for conducting and registering meteorological observations are 1 anemometer, 1 pluviometer, 1 mountain barometer, 1 Daniell's dew point hygrometer, 1 Regnault's ditto, 1 standard dry bulb thermometer, 1 standard wet bulb thermometer, 1 heat thermometer, 1 minimum in grass thermometer, 1 maximum in air thermometer, 1 minimum in air thermometer, 1 maximum wet thermometer, 1 minimum wet ditto.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	2. Table of 5 years' meteorological observations, 1856 to 1860.

Months.	Barometer. Mean.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Climate, Diseases, &c.
January	30·157	62·13	74·54	49·79	67·94	56·70	90·86	0·38	E.	0·85	—	Occasional showers of rain and some dust storms.
February	30·075	67·18	79·31	55·04	70·46	61·63	96·01	0·28	E.N.E.	0·96	—	Occasional showers of rain dust storms hot days.
March	29·981	73·67	85·51	61·86	79·43	67·95	101·78	—	N.W.	0·99	—	Dust storms, cloudless dews.
April	29·898	84·37	88·91	69·81	83·56	72·88	102·86	—	W.byN.	2·55	—	Do. do.
May	29·728	83·77	91·11	75·82	86·61	78·85	102·30	—	W.	2·38	—	Almost cloudless, dust storms, dews.
June	29·621	87·48	94·95	80·00	88·57	80·66	106·82	0·02	W.	1·56	—	Overcast, occasional passing showers of rain.
July	29·576	88·05	92·17	79·51	86·41	79·71	98·27	1·78	S.W.	1·19	—	Do. do. with occasional squalls.
August	29·658	82·08	87·66	76·78	82·83	77·54	95·26	1·54	N.	1·18	—	Overcast, sultry, occasional squalls.
September	29·811	81·24	87·41	75·65	82·52	76·40	99·02	0·44	N.W.	1·17	—	Several rainy days, overcast mornings and nights, some days dust storms.
October	29·970	79·41	89·77	68·80	83·38	73.43	106·33	—	N.W.	0·52	—	Almost cloudless, hot winds, dust storms, fogs, and dew.
November	30·044	73·19	86·75	57·61	78·88	62·81	106·55	—	N.	0·38	—	Do. do. mornings moist.
December	30·155	65·16	78·52	57·76	71·39	59·27	94·30	0·20	N.E.	0·59	—	Dews, dust storms, cold nights.

3. The climate is good. The month of November is characterized by dryness, July and August by humidity. The maximum of heat, about 86° to 94°, occurs in May and June, the intermediate spring and autumn months, viz., March, April, October, and November, being variable; December, January, and February, being the cold months. Fogs appear at times during the variable seasons, especially when they touch the extremes of the cold season. From May till September is the hot season, during which time strong westerly monsoon winds prevail. Damp cannot be said to exist at any time. Tree planting is but little attended to, less perhaps than it ought to be. There is but little irrigation, and what exists has no influence on climate, but the place is very often obnoxious to dust. Mephitism may also extend in a diluted form from the delta of the Indus to the station. Intermittent fevers show the noxious quality of the climate, and to these may be added hepatitis and diarrhœa as resulting from its influence. Cholera of late years has not existed. Scurvy is often severer amongst natives. The best diet, with the free use of vegetables, ample accommodation in space, clothing of a light texture in the hot season and warmer in the cold, should be provided. Drills, duties, and exercises ought to be more moderate in the hot season. The comparison of a good many years gives, as the result, the greatest mortality to the months of May, June, and December, but the sickness prevails rather at the changes of the season than when fairly set in. The deaths, mostly of chronic cases, are not coincident with the greatest sickness. The prevailing diseases are fevers and affections of the bowels.

4. There is no district in Sinde more conducive to health than that of the station. Ghizree is a mere experimental sanitary station, and owes its superiority to elevation and proximity to the sea. Manora, the promontory that forms the western boundary of the harbour, is perhaps the most healthy spot in Sinde, but it is too small for troops and inconvenient for supplies. It is also without water, like Ghizree.

5. I have served at Bombay, Tanna, Poona, Mulligaum, Surat, Baroda, Sukkur, Hyderabad, and Kurrachee. Of these stations, Baroda is the worst; Tanna, Sukkur, Hyderabad, and Bombay are bad; Poona and Mulligaum good; and Kurrachee the best. This last owes much to improved sanitary arrangements generally and in some of the barracks and hospitals.

III. Sanitary Condition of Station.

1, 2, 3. A map of the adjacent country, and plans of the stations and barracks, are transmitted.

4. Table of Barrack Accommodation.

Date of Construction.	Names of Buildings.	Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. No.	Windows. Height.	Windows. Width.	Doors. No.	Doors. Height.	Doors. Width.
	Barracks.			Ft.	Ft	Ft.				Ft. In.		Ft.	Ft.		Ft.	Ft.
1847	Artillery Barracks	3	50	136	24	18	58,752	1,175	65¼	1 7	18	7¼	4¾	4	11	4¾
1854	European New Barracks	10	100	277	24	23	152,904	1,529	66½	1 7	—	—	—	50	11	4
1843	Depôt Barracks	9	47	179½	30	14	75,390	1,604	114½	1 7	21	5	3½	3	7½	4½
1847	Native Infantry Lines	40	25	143	18	9¼	23,809	952	103	—	—	—	—	32	6¼	3
1846	Belooch Lines	16	50	175	17½	9¼	28,328	566¼	61	—	—	—	—	50	6¼	3½
1845	Sappers' Lines	6	25	124	15	8¼	15,345	613	74¼	—	—	—	—	28	5	2½
1851–4	Golundaz Lines	5	20	132	10	9	11,880	594	66	—	—	—	—	11	6	3

KURRACHEE.
BOMBAY.

Table of Barrack Accommodation—*continued.*

Date of Construction.	Names of Buildings.	Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. No.	Windows. Height.	Windows. Width.	Doors. No.	Doors. Height.	Doors. Width.
	GUARD ROOMS.			Ft.	Ft.	Ft.				Ft. In.		Ft.	Ft.		Ft.	Ft.
	Artillery Barracks.															
1847	Quarter Guard	1	7	24	19	16½	7,524	1,075	65	1 7	5	5	4	1	7½	4
	European New Barracks.															
1854	Quarter Guard Room	1	16	66	24	16½	26,136	1,634	99	1 7	—	—	—	12	8	4
1854	Hospital Guard Room	1	7	18	18	15¼	4,941	706	46	1 7	2	4	3	4	8¾	4
1835	Solitary Cells Guard Room	1	7	18	18	15¼	4,941	706	46	1 7	2	4	3	4	8¾	4
	Depôt Barracks.															
1843	Quarter Guard Room	1	14	56	24	16	21,504	1,536	96	1 7	1	5	4	5	8	4
1845	Solitary Cells Guard Room	1	7	18	12	13½	2,916	416	31	1 7	2	4	3½	2	7	4½
	Native Infantry Lines.															
1847	Quarter Guard	1	18	29	16	12¼	4,459	248	20	—	3	4	3	1	7	4½
	Belooch Lines.															
1850	Quarter Guard	1	16	29	16	15	6,960	435	29	—	3	4	3	1	7	4½
	Sappers' Lines.															
1855	Quarter Guard	1	4	15	15	12	2,700	675	56	—	2	4	4	2	7	4½
	PRISON CELLS.															
1847	Artillery Barrack Cells	2	1	10	10	17	1,700	1,700	100	1 7	—	—	—	1	7	4
1855	European New Barrack Cells	12	1	10	10	17	1,700	1,700	100	1 7	1	3½	3	1	6¾	3
1845	Depôt Barracks Cells	6	1	12	12	17	2,448	2,448	144	1 7	1	3½	2½	1	9	4
1859	Native Infantry Lines Cells	2	1	10	10	12	1,200	1,200	100	—	—	—	—	1	6	3

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	5. The windows are on opposite sides. There is a verandah 10 feet wide on both sides of the barracks, but it is never used as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils. 6. The bedsteads in use are boards on iron trestles. 7. The tents are made of strong Dungaree cloth. 8. The barracks, &c., are ventilated by openings in the roof, by fixed venetians in the walls, high up on both sides, by badgheers (windshafts), and by keeping the doors and windows open as much as possible. The ventilation is sufficient to keep the air pure night and day. No means are resorted to in order to cool the air of barrack-rooms, the sea-breeze being generally ample. 9. The barracks are constructed of stone and lime, the tents of canvass, and the huts of sun-dried mud bricks. 10. The floors are constructed of cut stone in the permanent barracks, and chunam and earth in others. They are raised 3 feet above the level of the ground in the former, and vary in the latter from 3 feet to 6 inches. There is no passage of air beneath. 11. The materials and construction of barracks, tents, and huts are suitable for the climate. The barracks are kept in repair by the Public Works Department, and the cantonment by the station staff officer, and in bazaar limits by the cantonment magistrate. The repairs are quickly executed. The commanding officer of the station is responsible for general sanitary state of the cantonments. Walls and ceilings of barracks are cleansed and lime-washed every six months. 12, 13, 14. Plans of the cook-houses, privies, and lavatories are transmitted. The washing and drying of linen is performed by washermen, and these means are sufficient. 15. The privies are ventilated by doors and openings in the roof. The barracks are lighted at night by oil lamps. 16. There are no main drains and sewers to the barracks; the system pursued is that of immediate removal. The surface and other drainage is conveyed into cesspools close to the buildings, which are emptied as soon as filled. No part of the barracks or hospitals is damp. The cesspits are about 2 feet in diameter by 3 feet deep, and their distance from the wells varies according to the position of the barracks, but none are sufficiently large to taint any well or tank. These cesspits are close in the rear of the men's quarters and hospital, and, as before stated, are emptied as soon as filled. There are no foul ditches. 17. The surface cleansing of the roads, waste ground, and the outsides of compounds is performed by sweepers under the barrack department, and is efficiently done. Owners of houses are responsible for cleanliness inside their own compounds. 18. There is no vegetation in the station, nor any old walls, &c., to interfere with the proper ventilation of the station, bazaar, &c. 19. There is no drainage in the bazaar, all filth being removed daily, and the bazaar kept as clean as the limited number of sweepers will allow. It is very crowded. The sweepers carry away the filth in carts to the kilns, where it is burnt. An increased number of sweepers

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	is required. The sanitary condition of the native houses near the station is for the most part good. They have cesspits, but the contents are emptied daily. No nuisance is experienced in barracks from the wind blowing over the native houses. 20. Animals for the use of soldiers are slaughtered about a mile from the station, and the offal is used as manure. No nuisance is experienced from the slaughter-houses. 21. Horses of parties authorized to let carriages on hire are located in stables and compounds attached to houses in cantonment. Care is taken that these places are kept in a state of cleanliness; if found otherwise a fine is inflicted. The manure is carried out of camp, like all other refuse. 22. All the horses, with the exception of the sick, are picketed in the open air. The sick stable consists of a quadrangle of sheds open to the inside, with an uncovered court-yard in the centre. The lines are immediately in the rear of the men's barracks, and a hundred yards to the north of the hospital, but to windward of it, and immediately in front of the married men's quarters. There are no dung-heaps, and the litter is removed daily to a distance of 500 yards by the troop-carts; the dung is carried off as it drops. The horses are picketed at intervals of four yards, with streets between them. 23. There are sufficient quarters for married people, and none occupy barrack-rooms with the men.
Officers' Quarters.	1. There are no public officers' quarters. The houses belong to private individuals, from whom the officers are obliged to rent them, according to proximity to the lines. The officers' houses at the north end of the camp are too small and very close together. Owners should be encouraged to improve their property, and some of the worst structures should be cleared away to admit of a freer circulation of air in that neighbourhood.
IV. Health of the Troops.	1. The station, district, and adjoining population are healthy, but sickness occasionally shows itself at the great changes of the year; that is, towards the beginning and close of the hot season. 2. Fevers, accompanied and followed by spleen disease and bowel affections, as also scurvy and ulcers, are the most prevalent diseases among the native population. 3. The healthiness of the natives is attributable to the salubrious situation, soil, proximity to the sea, and the monsoon winds; their unhealthiness to the swampy margin of the sea, and perhaps also to the Indus. The drinking water is the cause of the scurvy and diarrhœa. 4. The 64th Regiment and Troop Horse Artillery arrived about two years ago from field service. One Foot battery arrived about two years ago, and the other about a year since, from Bhooj. The native regiment came from Bombay about 1½ years ago. In the depôt recruits pass from England to the Punjab, and invalids and time-expired men from the latter to England. There is no precise information as to any striking peculiarities of disease before or since arrival at the station. A portion of the men's present accommodation is more unhealthy than the rest, the unhealthy portion being the old barracks, which are far too small. 5. The troops at the station are never camped out. 6, 7, 8. I have no experience of hill stations except personal, but approve of their selection for troops. The hill-station is to the plain as the open air to the hot-house. 9. No reply. 10. Ample accommodation, good food and water, with absolute cleanliness, would probably render many evils in hill stations. 11 to 16. No experience with the troops at hill stations. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. The surface and subsoil of this station are healthy. 19. Soldiers proceeding to India should be 20 years of age, and land there in November. On landing detachments proceed to the depôt barracks and regiments to their own barracks. Clothing adapted to the season is provided, and drill, &c., carried out, as in other regiments. Recruits, on landing, should be provided with good accommodation, suitable clothing, good food and water, and have moderate drill only, especially if not drilled before. Amusements should be provided, and they should be discouraged from drinking habits. 20. Troops should proceed direct from the home depôts to India, where, if they land in November, they might remain with their regiments, going to the hills for the hot season. 21. The mode of transport from port to the interior by water, embarking at Keemara or Ghizree (according to season) in steamers and flats; but sometimes men march to Tatta on the Indus, 60 miles, and embark there. About 11,000 men have passed up in the last six years, and it does not appear that any loss has been sustained. 22. A British soldier should serve 20 years in India. 23. There is no conflict of opinion at medical boards as regards invaliding. Medical officers compose the board. 24. Invalids leaving India for home should depart in January, February, or March.
Diseases.	1. There are weekly inspection parades at the station for the discovery of incipient diseases. 2. Scorbutus has existed, but is rare in European troops; among natives it is more prevalent, and has at times proved fatal; it exists also in recruits landed from England, about 10 per cent. being infected; it is attributed principally to the water, inferior accommodation, and bad food, such as putrescent fish. Good water and good food are the remedies. 3. Hepatic disease affects Europeans at the rate of 3 per cent., but scarcely 1 per cent. of natives are affected by it. It is originated by heat and the use of spirits, and also accompanies the severer fevers and dysentery. Pure air and disuse of spirits, modified clothing and exercise, such as drills, but not so as to fatigue, are the prophylactic measures for diminishing its frequency. 4. Dracunculus does not exist here unless imported. 5. In European regiments about 20 per cent. of the total sick are affected with venereal disease. In the artillery 10 per cent., and in native regiments 3 per cent. only are affected. The expulsion of prostitutes from bazaars, the removal of the restriction on marriage, and the education and religion of the soldier, are the safeguards against the disease. Lock hospitals have advocates, but were put down at the instance of the highest ecclesiastical authority.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*Diseases—cont.*	6. The troops at the station suffer from the following diseases of the epidemic and endemic class :— Fevers.—Intermittent, remittent, and continued. Dysentery.—Occasionally. Cholera.—But not since 1852. Rheumatism.—Occasionally. The proportion of admissions from the above diseases to total admissions is about 45 per cent. in Europeans, and 50 per cent in natives. The deaths to total deaths are about equal in Europeans and natives; viz., 33 per cent. 7. Small-pox is usually of a mild form in natives. Measles has been severe in its attacks. Croup is rare, but sometimes fatal. Diarrhœa is mild, and dysentery little known, except in children. Cholera, except sporadically, has not appeared since 1852. Scurvy affects the gums with ulceration, and the legs with hard and painful swellings, sometimes with cold, and sometimes with a hot sensation, and generally pain in the limbs; when fatal there are anœmia, præcordial pains, and syncope, death being often sudden. Fevers are mostly intermittent, the lighter cases being of the tertian type; the severer cases quotidian; remittent, or continued, generally of a milder form. Erysipelas is rare, and mostly very slight, but it has proved fatal. Syphilis is not generally untractable. Phagedœna has been seen at times. Zymotic diseases are not prevalent at any particular seasons, but vicissitudes of weather, such as the changes in spring and autumn, seem to influence fevers. The most prominent phenomena which precede or accompany their appearance are the variation in the force and direction of the winds, and humidity and increased range of temperature. Wherever ventilation in the bazaars is most interrupted fever prevails to the greatest extent. The smallest barracks are found similarly obnoxious to this disease. Bad food and bad dwellings with the natives, and fatigue with the troops, predispose them to fever. 8. There is nothing prejudicial in the nature of the soldier's duties or occupations in barracks, or habits on the march and in the field. Occasionally duties may be hard and too little sleep allowed. In habitual fever, hepatic, or visceral disease, spirit drinking must be fatal. 9. Quinine has not been tried at this station as a prophylactic against malarial disease. 10. To mitigate epidemic disease here the swamp should be extirpated, and the vegetation thinned; this latter, however, does not affect the troops. Strict attention should be paid to the kilns which are used for consuming refuse and all waste matter which collects in the cantonment. Better barracks should also be built in lieu of the old and small barracks.
V. INTEMPERANCE.	1. The soldiers at the station are generally temperate, confirmed drunkards being only about 1 per cent. 2. There is no information to be procured from the records of the hospital to enable us to say what is the proportion of diseases caused by intemperance, except as regards delirium tremens, which varies, but may be stated at about 1 per cent. Drunkenness is punished as an offence. 3. Distilled spirits are sold at the canteen and in the bazaar, but there is a prohibitory order against the sale of them to European soldiers in the latter place. Spirit is no part of the ration for soldiers either at the station, on march, or in the field. Morning drams are not allowed. Spirit is not given to convalescents except when prescribed. No drinks injurious to health, other than intoxicating drinks, are sold in the canteen or bazaar. 4. There is no reason to suppose that spirit is conducive to health, and it certainly often proves injurious. It is not conducive to efficiency and internal discipline. 5. With regard to the question whether it would be beneficial to the health of troops to restrict or abolish the use of spirituous liquors and their sale in the canteens or bazaars, so long ago as 1836 the Government gave this announcement,—"We attach great importance to "the measure recommended by the medical board for preserving the health of the European "troops under our Government, viz.,—the substitution, as far as practicable, of tea, coffee, "&c., for ardent spirits, and the establishment of temperance societies." Beer and porter have been imported and sold in the canteens in order to beat spirits out of the field. 6. There is only one degree of difference as to the influence on health in the use of malt liquor or wines as compared with spirituous liquors. 7. Coffee, tea, lemonade, and similar drinks are much used at the station; these are not injurious, but spirits and malt liquors are. 8. There is no spirit ration, and the use of other beverage is encouraged. 9. It might be beneficial to prohibit the sale of spirituous liquors in the canteen, and to permit only beer, coffee, tea, lemonade, &c., to be sold to the troops; but the prohibition should not be too suddenly introduced, lest confirmed drinkers of spirits should be driven to purchase clandestinely a more deleterious kind of liquor elsewhere. 10. We would recommend that the prohibition should not be made applicable to soldiers now in the service, but commence with recruits on first landing in India. 11. The canteen regulations of the 3rd European regiment prohibits the admission of any liquor, except that furnished by the commissariat, and the issue of any spirituous liquor, wine, or beer, directly or indirectly, to any native or follower of the regiment, nor can any liquor be taken away from the canteen except under an order from the commanding officer. No man on duty, drunk, or undergoing punishment, is permitted to enter the canteen, nor are any women or children admitted. The canteen is open from 12 to 1 o'clock for the issue of porter only, and from sunset until the quarter bugle for the issue of spirits and malt liquor. A supply of cool filtered water to be kept for the use of the men. Crowding is forbidden in the canteen. Every man is allowed one dram of spirits and a quart of porter daily. No spirits are issued on any occasion before the usual dinner hour, nor is a man allowed more than one dram of arrack, or one quart of malt liquor at one issue, which must be paid for with ready money. The canteen of Her Majesty's 64th regiment is open from half-past 11 till 12 o'clock, a.m., for the supply of malt liquor, and from 12 till a quarter to 10 o'clock p.m. for men of the regiment off duty. It is open from half-past two p.m. for the issue of spirits to those men who did not receive malt liquor before dinner, and from sunset to quarter to the first post for issue of one dram of spirits to each man. The quantity issued to each man is one quart of malt and one dram of spirits daily. All liquors are paid for. No water to be brought into the canteen for mixing with the arrack, except in presence of the officer on duty. The bazaar regulations prohibit the sale of liquors there without a licence. No liquor can be sold to European soldiers, or any person amenable to the articles of war under the rank of warrant officer, without a licence.

References to Subjects and Queries.	Replies.
VI. Diet.	1. The ration for Queen's troops and European troops in the Indian army is the same, and consists of meat 1 lb., bread 1 lb., rice 4 oz., salt 1 oz., tea $\frac{5}{7}$th lb., vegetables 1 lb., firewood 3 lbs. Mutton is given twice a week, and beef five times, and the vegetables as the products of the station may be. An inspection of the ration is made by the commissariat agent, regimental quartermaster, quartermaster-serjeant, orderly officer, and occasionally by the officer commanding the regiment or corps. 2. A complete ration, including vegetables, is provided for the troops, but no fruit. The stoppage is 3 annas 4 pie, or 5*d.* per diem. A soldier has three meals a day, viz.,—breakfast at 8 a.m., consisting of tea or coffee and bread, with part, perhaps, of the meat ration. Dinner at 1 p.m., consisting of meat, vegetables, and bread, and a supper of tea and bread. The proportion of vegetable which enters into the constitution of the ration is about one-third its weight. 3. The ration is ample for ordinary times; but fruits or other vegetables may be requisite in excess when scurvy prevails. There are no particular arrangements taken to prevent the disposal of the ration. 4. The means and apparatus for cooking are detached kitchens, one camp kettle containing seven gallons, one baking dish, and a three-gallon tea kettle for every 10 men. The cooks are Portuguese. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. The food is boiled for dinner, and the cooking is properly done, and sufficiently varied. In some regiments the men have tea or coffee before a march, but there is no general rule for this, nor could any hold good. 5. Soldiers' gardens could not be established here.
VII. Dress, Accoutrements, and Duties.	1. The soldiers' dress and accoutrements are as follows:—

Return of the Arms, Accoutrements, and Regimental Necessaries of Foot Artillery, European Soldier, Gun Lascar, and Driver.

Camp Kurrachee, 7th October 1860.

| — | Arms and Accoutrements. | | | | | | | | | Regimental Necessaries. | | | | | | | | |

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References to Subjects and Queries.	Replies.

VII. Dress, Accoutrements, and Duties—*cont.*

LIST of CLOTHING for a EUROPEAN INFANTRY SOLDIER.

No.	Articles.	
Furnished by the State.	1 knapsack and slings	Agreeably to patterns furnished by Government.
	1 dress cap	
	1 red coatee (dress)	
	1 shell jacket (undress)	
	1 pair trousers (woollen cloth)	
	1 great coat	
	1 canvass bag	
Furnished by the soldier.	2 khakee tunics	Agreeably to sealed patterns approved of by the Commander-in-Chief.
	2 pairs khakee trowsers	
	4 white shirts	
	2 check ditto	
	3 banyans (flannel)	
	4 pairs socks (cotton)	
	2 ditto (worsted)	
	2 pairs braces	
	4 towels	
	2 khakee covers for dress cap	
	1 forage cap and strap	
	2 khakee covers for ditto	
	3 pairs of shoes	
	1 clothes brush	
	2 shoe brushes	
	1 hair brush	
	1 comb	
	1 razor, brush, and soap	
	1 button stick and brush	
	1 marking stick	
	1 sponge	
	1 holdall	
	1 knife, fork, and spoon	
	1 account book	
	1 mess tin, with cover	
	1 gun stopper	
	1 oil rag	
	1 sleeping carpet (6 feet by 2½)	
	1 numda mattress	
	2 cotton covers for ditto	
	2 sheets	
	2 kumblee blankets	
	1 coir pillow	
	2 cotton cases for ditto	
	2 pairs of small brass or iron hooks, 1 inch long, to be sewn on the right and left sides of the coatee and shell jacket, to sustain the waist-belt.	

NATIVE INFANTRY SOLDIER.

No.	Articles.	
Furnished by the State.	1 knapsack and slings	Agreeably to sealed patterns approved of by the Commander-in-Chief.
	1 red jacket (dress)	
	1 red jacket (undress)	
	1 pair trousers (woollen cloth)	
Furnished by the soldier.	1 great coat	
	3 pairs trousers (white linen)	
	2 ditto (black cotton)	
	1 epaulettes or wings for dress coat	
	1 Kilmarnock forage cap	
	1 chin chain and chin strap	
	2 white cotton covers for forage cap	
	2 pairs shoes	
	2 pairs braces	
	1 clothes brush	
	1 shoe brush	
	1 button stick and brush	
Found by the soldier.	1 oil rag	
	1 ruzzai	
	2 meerazeis	
	1 dhoputta (2½ yards long by 2½ feet in width)	
	2 chudders	
	2 dhoties or paijamas	
	1 sleeping carpet (6 feet by 2½ feet)	
	1 brass lota (small, 5½ inches wide, 3½ deep, and cord)	
	1 brass lota (larger size)	
	1 tuvwa (iron, 9 inches wide)	
	1 thaler (brass, 9 inches wide)	
	1 kuttora (brass)	
	1 chimcha (brass)	
	1 chimta (iron)	
	1 canvass bag, agreeably to pattern	
	2 pairs small brass or iron hooks, 1 inch long, to be sewn on the right and left sides of the jacket, to sustain the waist-belt.	

HORSE ARTILLERY GUNNER.

No.	Articles.
1	forage cap and chin strap.
2	khakee covers.
2	white helmet covers.
1	pair of cloth overalls, leathered.
3	pair of khakee overalls.
3	khakee coats.
4	white shirts.
2	barrack change ditto.
3	stomachers.
4	pair white cotton socks.
2	ditto, worsted ditto.
4	towels.
2	pairs braces.
2	pairs boots.
1	pair of shoes with clasps.
1	pair of chain straps.
1	numbda.
2	cotton covers for ditto.
1	coir pillow.
2	pillow cases, cotton.
1	saddle bag, lined.
1	haversack.
1	jamboo, plate, and cover.
1	hair brush and comb.
1	clothes brush.
2	shoe brushes.
1	razor, brush, and strop.
1	sponge.
1	button stick and brush.
1	marking stick.
1	knife, fork, and spoon.
1	holdall.
1	account book.
1	khakee cover and turban for wicker helmet.
1	wicker helmet.

ACCOUTREMENTS.

1 pouch belt and pouch. | 1 sword belt.

HORSE ARTILLERY GUN LASCARS.

1 undress jacket, cloth.	2 ditto cap covers.	2 brushes.
1 ditto overalls.	2 pair of shoes.	1 lota.
2 khakee jackets.	1 button stick.	1 cooking pan.
2 ditto overalls.	1 sponge.	2 talees.

ACCOUTREMENTS.

1 sword belt. | 1 pouch belt.

The present dress is suitable to the climate, and for the soldiers' duties by day and night, and no improvements are suggested. The dress for the guard in the hot season is drill dyed earth colour (khakee), and for the cold season, woollen. There are sun shades and boxes for the sentries, and well built guard houses for protection from sun and wet.

Duties.

1. A man should be thoroughly drilled at home before being sent to India.
2. The usual routine of a soldier's duties is,—morning parade for half an hour in the hot weather, and an hour in cold, Sundays and holidays once a week excepted; guard happens every 6 days. The duties do not affect the men's health. The best time for drills, parades, and marches is in the morning and evening, varied a little in time, according to season. The men have 6 nights in bed during the week.

References to Subjects and Queries.	Replies.
VII. Dress, Accoutrements, and Duties—*Duties—cont.*	3. Guards are mounted in the barrack square or within 100 yards of the barracks. Night guards last 12 hours; day and night guards 24 hours. There are roll-calls thrice daily, and occasionally others. The men do not suffer in health from night guards.
VIII. Instruction and Recreation.	1. The following are the means of instruction and recreation at the station:—There are ball courts, skittle grounds, schools with schoolmasters, library, and reading room. There are workshops and a theatre, but the former are not efficient, and the latter receives no aid from Government. There are no day rooms, soldiers' clubs, gardens, or gymnasia. The above means are not sufficient to keep all the men occupied during the wet season and heat of the day. A restriction is placed on the men when off duty as to exposure to sun and rain, when such is thought necessary, and with beneficial results. 2. Soldiers should be encouraged to work at their original trades or to acquire some useful occupation. Gymnastic exercises, under qualified instructors, should be available. Were restriction on marriage removed, and the standing of the soldier raised, many would find the best employment and recreation in the care, instruction, and amusement of their families. 3. The institution of soldiers' savings' banks would be advantageous. 4. There is no shade from trees at the station, but there are good verandahs, though little fit for exercise.
XI. Military Prisons.	1. The cells for prisoners are well built and ventilated. The space is ample for one man in each cell, but not for more without crowding.
X. Field Service.	1. There are no special local regulations for field medical service not included in the General Presidency Regulations. 2. The medical officer has no positive power as regards the conduct of the line of march, camping, &c., but if consulted he would give his advice. If he thought an error was committed he would point it out; or, if he believed that health suffers from existing arrangements, he would seek to have them altered. 3. The arrangements for preserving the health of troops, in the selection of camping ground, and general sanitary regulations, are all provided for in the general regulations of the service. The senior medical officer is looked to for advice in sanitary matters. Something more positive, some initiatory power, should be vested in the medical officer of each corps or civil or military station. The medical officers, in fact, should be the eyes, and the quartermaster-general's department the hands of the army, empowered to maintain, and ever busy in maintaining a perfect military sanitary police. 4. Field hospital arrangements (see Appendix).
XI. Statistics of Sickness and Mortality.	The following tables give the required information under this head.

KURRACHEE.

European Troops.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1850-51	H.M.'s 8th Regiment „ 64th Do. „ 83rd Do.	1,724	491	5	—	—	139	8	141	3	446	11	47	4	—	—	1,081	4	2,345	35	136·0	2·0
1851-52	„ 64th Do. „ 83rd Do.	1,629	610	11	—	—	169	7	67	1	666	49	78	7	19	12	942	5	2,551	92	156·5	5·6
1852-53	„ 64th Do. „ 83rd Do.	1,681	2,798	37	1	—	193	10	69	4	418	10	110	12	1	—	866	8	4,456	81	265·0	4·8
1853-54	„ 64th Do. „ 83rd Do. „ 86th Do.	1,313	2,053	4	2	—	174	4	97	2	306	4	70	2	16	8	1,004	3	3,722	27	283·4	2·0
1854-55	L.W. H.M.'s 83rd Regiment H.M.'s 86th Regiment	1,187	519	1	—	—	132	4	82	5	360	10	32	1	—	—	840	2	1,965	23	165·5	1·9
1855-56	„ 86th Do.	297	97	3	—	—	43	1	52	2	148	2	8	—	—	—	248	—	596	8	200·6	2·7
1857-58	„ 4th K. O. Regiment „ 51st Regiment	661	196	2	—	—	5	—	5	1	40	2	—	—	—	—	144	—	384	5	58·0	0·7
1858-59	„ 46th Do. „ 51st Do.	656	238	9	—	—	23	1	24	1	93	1	3	—	1	1	358	—	740	13	112·8	1·9
1859-60	„ 64th Do.	958	294	1	1	—	76	3	33	1	247	3	62	1	—	—	752	2	1,465	11	152·9	1·1
	European Troops in the Indian Army.																					
1850-51	1st Troop Horse Brigade	42	23	—	—	—	6	—	9	—	26	2	7	—	—	—	71	—	142	2	338·0	4·7
1851-52	Do. do.	120	32	—	—	—	13	—	16	1	66	2	7	—	—	—	148	—	282	3	235·0	2·5
1852-53	Do. do.	144	95	3	—	—	13	—	12	—	42	—	10	—	—	—	127	—	299	3	207·6	2·0
1853-54	Do. do. 2nd Bombay European Regiment Light Infantry	405	82	—	—	—	72	2	33	—	85	2	22	1	6	3	305	4	605	12	149·3	2·9
1854-55	1st Troop Horse Brigade 4th Do. do. 4th Company 1st Battalion Artillery 2nd Bombay European Regiment Light Infantry	698	196	3	—	—	77	3	46	—	192	7	51	1	—	—	461	3	1,023	17	146·5	2·4
1855-56	4th Troop Horse Brigade 4th Company 1st Battalion Artillery 1st European Regiment Fusiliers	1,067	199	3	1	—	82	2	70	4	291	6	78	—	—	—	876	2	1,597	17	149·6	1·5
1856-57	4th Troop Horse Brigade 4th Company 1st Battalion Artillery 1st European Regiment Fusiliers Depôt, 2nd European Regiment Light Infantry	1,124	466	1	—	—	103	4	73	7	222	2	92	2	—	—	926	3	1,882	19	167·4	1·6

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EUROPEAN TROOPS—*continued.*

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1857-58	3rd Troop Horse Brigade 1st Company 2nd Battalion Artillery 4th Company Reserve Artillery 1st European Regiment Fusiliers 2nd European Regiment Light Infantry	802	1,277	6	—	—	70	4	75	8	244	6	33	2	—	—	602	7	2,307	33	287·6	4·1
1858-59	4th Reserve Artillery Depôt, 1st European Regiment Fusiliers	191	207	—	—	—	22	—	27	—	95	3	40	—	—	—	315	3	706	6	369·6	3·1
1859-60	2nd Troop Horse Brigade 1st Company 3rd Battalion Artillery 4th Company 3rd Battalion Artillery 1st European Regiment Fusiliers 3rd European Regiment	969	494	1	—	—	81	3	65	4	279	6	68	2	10	2	1,006	9	2,003	27	206·7	2·7

NATIVE TROOPS.

1850-51	6th Company 4th Battalion Artillery 1st Grenadier Regiment Native Infantry 5th Regiment Native Infantry 19th Regiment Native Infantry 27th Regiment Native Infantry	1,864	902	9	4	—	35	5	8	—	133	3	12	1	6	4	545	4	1,645	26	88·2	1·3
1851-52	6th Company 4th Battalion Artillery 1st Grenadier Regiment Native Infantry 5th Regiment Native Infantry	1,704	690	4	15	—	21	1	3	—	121	1	13	—	13	3	576	9	1,452	18	85·2	1·0
1852-53	3rd Company 4th Battalion Artillery 6th Company 4th Battalion Artillery 1st Grenadier Regiment Native Infantry 6th Regiment Native Infantry 8th Regiment Native Infantry 14th Regiment Native Infantry 22nd Regiment Native Infantry 28th Regiment Native Infantry	1,605	1,555	11	10	—	57	3	7	—	158	5	12	1	1	—	734	6	2,534	26	157·8	1·6
1853-54	3rd Company 4th Battalion Artillery 8th Regiment Native Infantry 14th Regiment Native Infantry	1,891	569	4	56	—	74	3	4	—	198	1	25	—	—	—	847	6	1,773	14	93·7	0·7
1854-55	3rd Company 4th Battalion Artillery 5th Company 4th Battalion Artillery 2nd Grenadier Regiment Native Infantry 8th Regiment Native Infantry 14th Regiment Native Infantry	1,714	659	6	10	—	65	8	3	—	262	1	19	—	—	—	864	7	1,882	22	109·8	1·2
1855-56	2nd Grenadier Regiment Native Infantry 8th Regiment Native Infantry 16th Regiment Native Infantry 1st Belooch Battalion	1,974	1,268	2	2	—	96	8	10	—	385	6	31	1	—	—	1,294	10	3,086	27	156·3	1·3
1856-57	14th Regiment Native Infantry 16th Regiment Native Infantry 1st Belooch Battalion 2nd Do.	1,757	2,017	8	1	—	171	8	11	3	225	6	15	1	—	—	1,083	5	3,523	31	200·5	1·7
1857-58	3rd Company 4th Battalion Artillery 14th Regiment Native Infantry 21st Regiment Native Infantry	1,606	1,630	8	28	—	90	9	3	—	236	4	10	—	—	—	797	4	2,794	25	173·9	1·5
1858-59	1st Grenadier Regiment Native Infantry 14th Regiment Native Infantry 21st Regiment Native Infantry Detachment 30th Regiment Native Infantry 1st Extra Battalion	1,581	831	3	37	—	82	4	3	—	133	—	13	—	—	—	701	3	1,800	10	113·8	0·6
1859-60	1st Grenadier Regiment Native Infantry Wg. 3rd Belooch Battalion 1st Extra Battalion	1,377	637	7	11	2	131	4	4	—	136	1	14	—	—	—	1,175	11	2,108	25	153·0	1·8

Women and Children.

Years.	CORPS.	Women. Strength. Europeans.	Women. Strength. Indo-Europeans and Natives.	Women. Strength. Total.	Women. Treated. Europeans.	Women. Treated. Indo-Europeans and Natives.	Women. Died. Europeans.	Women. Died. Indo-Europeans and Natives.	Women. Ratio per Cent. to Strength. Treated.	Women. Ratio per Cent. to Strength. Died.	Children. Strength. Europeans.	Children. Strength. Indo-Europeans and Natives.	Children. Strength. Total.	Children. Treated. Europeans.	Children. Treated. Indo-Europeans and Natives.	Children. Died. Europeans.	Children. Died. Indo-Europeans and Natives.	Children. Ratio per Cent. to Strength. Treated.	Children. Ratio per Cent. to Strength. Died.
1852–53	H.M.'s 64th Regiment	91	—	91	104	—	3	—	114·2	3·3	118	—	118	85	—	4	—	72·0	3·3
	83rd Do.	96	—	96	218	—	9	—	227·0	9·3	131	—	131	190	—	24	—	145·0	18·3
1854–55	R.W. H.M.'s 83rd Regiment	59	—	59	120	—	4	—	203·3	6·7	32	—	32	153	—	5	—	478·1	15·6
	H.M.'s 86th Regiment	92	5	97	116	3	4	—	122·6	4·1	183	7	190	234	6	19	—	126·3	10·0
1859–60	„ 64th Do.	83	4	87	86	4	3	—	103·4	3·4	166	10	176	101	15	8	—	65·9	4·5
1852–53	1st Troop Horse Brigade	8	8	16	11	7	—	—	112·5	—	14	12	26	1	2	—	—	11·5	—
	Do. do.	8	9	17	14	7	—	—	123·5	—	10	14	24	1	3	1	3	16·6	16·6
1853–54	2nd European Regiment Light Infantry	50	5	55	29	2	3	—	56·3	5·4	71	9	80	38	1	10	—	48·7	12·5
1854–55	4th Troop Horse Brigade	7	6	13	15	1	—	—	123·0	—	14	15	29	31	46	1	—	265·5	3·4
	4th Company 1st Battalion Artillery	3	5	8	—	—	—	—	—	—	1	4	5	—	—	—	—	—	—
1855–56	4th Troop Horse Brigade	7	7	14	6	10	—	—	114·3	—	13	12	25	9	7	1	1	64·0	8·0
	4th Company 1st Battalion Artillery	3	4	7	7	6	—	1	185·7	14·2	3	3	6	2	1	—	1	50·0	16·6
	1st European Regiment Fusiliers	38	29	67	40	28	—	1	101·4	1·5	47	35	82	32	15	4	2	57·3	7·3
1856–57	1st European Regiment Fusiliers	40	26	66	60	38	—	3	148·4	4·5	53	36	89	45	24	4	6	77·5	11·2
	Depôt, 2nd European Regiment Light Infantry	45	2	47	31	—	—	—	65·9	—	71	2	73	37	—	1	—	50·6	1·3
1857–58	4th Company Reserve Artillery	1	2	3	1	2	—	—	100·0	—	—	6	6	—	5	—	—	83·3	—
	Depôt, 1st European Regiment Fusiliers	35	22	57	38	28	—	—	115·7	—	50	35	85	40	11	4	1	60·0	5·8
1858–59	4th Company Reserve Artillery	2	1	3	4	1	2	—	166·6	66·6	—	—	—	—	—	—	—	—	—
	Depôt, 1st European Regiment Fusiliers	40	26	66	35	9	1	—	66·6	1·5	53	41	94	77	33	16	4	117·0	21·2
1859–60	1st Company 3rd Battalion Artillery	5	3	8	5	—	—	—	62·5	—	9	5	14	3	—	—	—	21·4	—
	4th Company 3rd Battalion Artillery	5	2	7	4	—	—	—	57·1	—	2	6	8	—	1	—	—	12·5	—
	2nd Troop Horse Brigade	11	2	13	16	1	—	—	130·7	—	21	6	27	15	—	1	—	55·5	3·7
	3rd European Regiment	28	13	41	31	7	—	—	92·7	—	32	16	48	36	3	7	2	81·2	18·7

By order of the Principal Inspector-General, Medical Department,

W. C. Coles, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 30th January 1861.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1, 2. The hospital for the permanent infantry is well removed from the barracks, but all the others are near to them. There are no stables, but the artillery hospital is very close to where the horses are picketed. The general hospital is nearest to the bazaar, which is 200 yards distant. The others are remote from it, and, with the exception of one native hospital, from the residents' houses also. The sites are pretty open and freely ventilated, with the exception of the hospital above named, and generally healthy as to elevation, drainage, &c. 3. There is an abundance of water, though not of good quality; but a project for a permanent supply of good water for Kurrachee is under consideration. 4. There is no drainage, all refuse, solid or otherwise, being removed daily by sweepers.

Table of Hospital Accommodation

Date of Construction.	Names of Buildings.	Wards or Huts.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. No.	Windows. Height.	Windows. Width.	Doors. No.	Doors. Height.	Doors. Width.
				Ft.	Ft.	Ft.	Ft.			Ft. In.		Ft.	Ft.		Ft.	Ft.
1847	Artillery Barrack Hospital	1	28	79	24	28	52,288	1,867	68	1 7	10	5½	4	5	9½	4
1854	New European Barrack Hospital	1	100	368	24	18	158,976	1,589	88	1 7	9	5	4	58	10¾	4
1843	Depôt Barrack Hospital	1	100	314	31	14	136,276	1,362	97	1 7	32	5	3½	12	7½	4½
1844	Native Infantry Lines Hospital	1	100	128	19	13	31,616	316	24	1 7	26	4	3	4	6	3
1855	Belooch Lines Hospital	1	100	160	22	18	63,360	633	35	1 7	16	5	4	8	7	4

KURRACHEE. BOMBAY.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	5. The wards of the hospitals (with the exception of one native hospital) are raised about 3 feet above the ground, but there is no perflation of air beneath. No provision is made for carrying away the roof water, some of which sinks into the subsoil, the rest flowing away. There is no surface drainage or guttering round the hospital. The rainfall at Kurrachee is small. The older hospitals are constructed of sun-dried bricks, and the new one of stone. The general hospital and one native hospital have double roofs and walls, but the others are single. They are all mostly as cool as private dwellings. The hospitals are provided with verandahs from 8 to 12 feet in breadth, which are a sufficient protection except from the morning and evening sun. In the general and native hospitals, which have double roofs and walls, the verandahs are inside. The closed verandahs are only used for the accommodation of sick, &c., when the wards are crowded. The open ones are never used for that purpose. With the exception of the last built hospital for the infantry barracks, all the hospitals consist of one flat only. The hospitals are so placed as to receive the full benefit of the prevailing winds. The windows open vertically in halves, and their arrangements and construction are conducive to ventilation and coolness. 6. The wards are ventilated by doors, windows, and openings in the roofs. These means in the new hospitals are adequate, but are not so in the old. There are no jalousies or jhilmils. 7, 8. No apparatus for cooling or warming the air in wards exists. The walls and ceilings of the wards are cleansed and lime-washed once every three months. 9. The privies are immediately in rear of the hospitals, and are provided with cesspools, which are cleansed daily, and quick-lime put into them. They are not offensive if carefully kept, but they admit of improvement. 10, 11. Sheds supplied with tubs are provided for the men to wash in. Slipper baths are used as required for bathing the sick, but are neither sufficient or convenient for the purpose. 12. Washermen wash and dry the hospital linen apart from the hospital, and are sufficient. 13. The storage is sufficient and dry. 14. Iron bedsteads, which were long since recommended, are in use, but not universally. They are 6 ft. 5 in. by 2 ft. 8 in. by 1 ft. 6 in. Wooden cots are also used in the European hospital, and entirely in the native hospitals. They are 6 ft. 4 in. by 2 ft. 10 in. by 1 ft. 2 in., and are made of squared timber laced with cotton tape. The bedding is suitable, and consists of straw in bed-cases, with pillows of the same; sheets, blankets, and quilts according to season. Every bedstead should be of iron, the wooden ones harbouring vermin. 15. The kitchens which are near the hospital are open and well-aired rooms. The cooks are Portuguese, and the apparatus like that used in the regiments. In this respect the hospitals resemble private families, but the younger and inferior cooks, from being paid less, are found in hospitals. 16. Diet tables, diet rolls, &c., are transmitted. 17. A hospital serjeant is attached to every hospital for European troops, under orders of the medical officer; a matron and assistant matron being provided for the female hospital. There are 10 native ward boys, and when the sick exceed 80 in number one additional boy for every 8 patients, and one also, at the discretion of the surgeon, for every bedridden patient, and frequently a comrade in extreme cases. The attendance is sufficient in number but often inferior in kind, and embarrassment arises whenever there are fresh regiments or fresh ward boys; difficulty also from ignorance of the language. In native hospitals there is a hospital orderly, usually a havildar (serjeant), and the bedridden are attended by comrades, who obtain leave from duty for the purpose. 18. The new hospital is the only one which is adequate. The depôt hospital is not large enough, and one native hospital has been condemned more than once. The artillery hospital is good, but requires an upper story, and the general hospital is in want of many improvements. Phagedœna and gangrene have been witnessed, for which occasional crowding may perhaps account. Phlegmasia dolens has occurred, but not in hospital, and no case of pyœmia nor any epidemic originating in hospital have been seen. 19. Want of space is the great defect. Better adaptation of privies and baths, more open space in the walls for ventilation, and an experienced matron to superintend the cooking and distribution of diets in the wards would be most desirable. 20. There is no fenced ground with shaded walks and seats for the exercise of convalescents. They walk in the vicinity of the hospital or verandah, or go out in an ambulance cart in the evenings. 21. Separate hospitals for women and children are built near to the hospitals in European regiments, and are provided with matrons and assistant matrons and ward women. No such arrangements exist for native corps. The present arrangements are satisfactory for the Europeans. In every station for native troops a hospital for females with a maternity hospital ought to be established. 22. There are no local hospital regulations not included in the General Presidency Medical Regulations. 23. Matters appertaining to the sanitary state of hospitals, &c., are all presented in the regulations, and there is little latitude of action for the medical officer. His suggestions may be acted upon or not by higher authority. 24. There are no convalescent wards or hospitals, but when there are several wards one may be used for convalescents, but hospital rules in their integrity should be uniformly administered.
XIII. BURIAL OF THE DEAD.	1, 2. The burial ground for British troops is one mile from and to leeward of the station. Its area is 600 square feet, the soil and subsoil are of clay, sand, gravel, and argillaceous earth. There is no drainage, but decomposition takes place quickly, and the ground is carefully kept. 3. The grave space allowed is, for adults 7 feet by 2 feet; for children 4 feet by 1 foot 6 inches, and the interval between each grave is 3 feet. Graves are 5 feet deep; they are never re-opened. Interment takes place at ordinary times from 12 to 24 hours after death, and during epidemics within 6 hours after decease. Mussulmans and the poorer classes and the lower castes of Hindoos bury their dead. Other classes of Hindoos burn them. Cremation and burial grounds are about 2 miles from the camp. The graves, which are never re-opened or used for more than one corpse, are deep but pretty close. The dead are quickly disposed of. There are no regulations on these points but the customs of the people.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead —*cont.*	4. The new burial ground has never been offensive, but in the old burial ground, now seldom used, quick-lime was occasionally resorted to. 5. The dead of camp followers and bazaar people are disposed of in the same manner as native soldiers. 6, 7, No injury accrues to the public health from the present practice, and no suggestions for improvement can be offered.

(Signed) H. Stiles, Colonel and President,

Members. { D. Grierson, M.D., Surgeon Major, Staff Surgeon.
J. de Mesurier, Captain, Executive Engineer.
A. F. Cunynghame, Major-General, Commanding Sinde Division.

4th January 1861.

Appendix I.

Field General Hospitals.

1. Whenever it may become necessary, in consequence of the increased number of sick and wounded men during war or distant campaigns, to have recourse to field general hospitals in fixed situations, one or more such hospitals are to be established accordingly, upon the general principles, in regard to supplies of medicines, diet, and necessaries, prescribed for regimental hospitals.

2. As soon as the officer commanding the troops shall have determined, in communication with the deputy inspector-general, on the place at which a field hospital is to be established, and the number of patients to be transferred to it from the regimental hospitals in camp, or for whom it might be advisable to prepare hospital accommodation and necessaries, instructions are to be forthwith issued to the commissariat for the immediate preparation and supply of all articles, including cots, for the sick and wounded, with the requisite establishment of hospital servants furnished by that department, according to the statements to be prepared by the inspector-general of hospitals, and sanctioned by the officer commanding the troops.

3. As the hospital establishments of European regiments, of which the sick and wounded are sent to field hospitals, may admit of being for a time diminished, as many servants and as much clothing and bedding shall accompany sick and wounded men sent from the hospitals as can, in the judgment of the deputy inspector-general, be spared, with reference to the present exigencies or prospective wants of such regimental hospitals.

4. The commander-in-chief, when with the army, will, in the same orders which direct the formation of one or more field hospitals, authorize the provision by the proper departments of all articles necessary for the purpose, and the entertaining of the requisite establishments. When the commander-in-chief is not present with the army, or a division of it, the officer commanding will issue orders to the above effect, under discretional authority, to be previously consigned to him.

5. Medicine indents are to be prepared by the surgeon or medical staff officer, who may be selected for the charge of a field hospital, under the instructions of the deputy inspector-general, by whom they are to be countersigned, for such supplies of those articles as may be deemed necessary, and can be spared from stores in camp in the first instance, until further supplies can be drawn from the stationary depôts, or the indents shall be made on the stationary depôts, in the event of its being practicable, in consequence of previous arrangement, for the first demands to be thence supplied in proper time.

6. Whenever the probable time and place at which it may become necessary to establish one or more general hospitals, for the reception of the sick and wounded during war, can be anticipated by the commander-in-chief, or the officer commanding the troops, the earliest intimation will be given to the commissariat and the nearest medical depôts, in order that the attention of officers in charge of those departments may be directed to the probable demands that will be made upon them, or according to the nature and probable duration of the service in prospect. Adequate supplies for one or more general hospitals will accompany the army in the first instance, or be intermediately brought forward to such advanced situations as may be found convenient.

7. The expense that may be incurred in furnishing petty stores, necessaries, &c., by the hospital storekeeper is to be charged in a contingent bill monthly, liable to be attested upon oath when required. These bills are to be countersigned by the surgeon or senior medical staff officer in charge of the hospitals in which the articles charged for shall have been expended (or for which they may have been provided, in the case of any remaining on hand at the end of each month), and also by the inspector-general of the division in testimony of their correctness, to the best of the knowledge and belief of these officers; statements, in the form of indents, which are to accompany the bills for payment, are also to be signed by the surgeon of the hospital, setting forth the several articles which have been required from time to time for the use of the sick and wounded.

8. An advance of cash will be made on this account, in the first instance, on the application of the surgeon or medical staff officer, who may be appointed to the charge of the hospital, to be made through the deputy inspector-general, and a sum equal to the amount required for the monthly disbursements is to be advanced by the paymaster, or the collector, where there may be no pay officer at hand, upon timely application being made by the hospital storekeeper, through the surgeon in charge of the hospital. The amount to be adjusted as usual in other cases of moneys being advanced by collectors on account of military disbursements.

9. A medical staff, consisting of a surgeon for the general charge and superintendence of the field general hospital, with a salary of Bombay rupees 600 per month, exclusive of the usual pay, batta, and tent allowance of his rank, with as many surgeons or assistant surgeons for the duties thereof as may be necessary, and can be spared, together with an assistant surgeon for the appointment of hospital storekeeper to the general hospital, will be appointed by the commander-in-chief, to whom a list of those most available shall be submitted by the medical board or by the deputy inspector-general, if those appointments be made immediately in the field; care being taken in all such cases not to remove from the charge or duties of regimental hospitals either the surgeon or assistants, to the prejudice of the management and requisite duties of those hospitals respectively; and to provide for this eventual arrangement and other calls for medical aid during war, a sufficient medical staff will always be appointed in the first instance, when practicable, to do duty with every considerable division of the army that may be ordered to take the field.

10. The assistant surgeon who may be appointed to act as hospital storekeeper to a general hospital shall invariably, in addition to that charge, afford such personal medical attendance to the sick as may be required of him by the surgeon in charge of the hospital.

11. An officer or other agent of the commissariat department will attend every field general hospital that may be thus established during war, as well for the purpose of furnishing and maintaining the requisite hospital equipments and diet for the sick, as for supplying provisions to the men who may be discharged from the hospital fit for duty until they shall rejoin their corps.

12. An apothecary and steward, with such other first-class servants as may be necessary, are to be appointed, on the recommendation of the deputy inspector-general, to each field general hospital that may be established during war; and such a number of second-class servants as he may deem proper shall be drawn from the commissariat for the same purpose.

13. The establishments that may be allowed for field general hospitals, as well as the establishments fixed for the medical depôts in the field, are to be mustered on the first of each month by deputy inspector-generals or the commanding officers on the spot, or officers properly authorized,

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as the case may be, and regular muster rolls are to be prepared for all those establishments, and to be attested in the usual manner by the mustering officer, whoever he may be.

14. The pay of hospital servants employed in field general hospitals is to be drawn from the commissariat, and paid according to the rules prescribed on the subject for regimental hospitals.

15. An officer from each corps is always to be sent in charge of the sick, when they amount to 20 men, who may be sent from regiments or corps of Europeans to field general hospitals, and a sufficient number shall remain on that duty until it may be necessary to accompany the men when ordered to rejoin their corps.

16. Whenever men may be discharged from field general hospitals as no longer requiring medical attendance, yet in the opinion of the surgeon requiring some modification of their ordinary diet, rations of provisions, if Europeans, will be supplied to them by the commissariat, on provision rolls framed on this principle, to be presented daily by the commissioned or non-commissioned officers under whose charge they may be placed; and the provisions to be thus supplied may be made to vary from the articles usually issued to troops in health, according to the state of convalescence of men thus circumstanced, and for whom certificates are to be furnished by the medical staff who may have attended them in the field general hospital, describing the diet, &c. most proper for the men whilst in progress for their corps, according to which the provision rolls are to be prepared, and the certificates above mentioned are to be countersigned by the officer in charge of the men, and delivered as vouchers to the commissariat department, stoppages being made from the men on this account, agreeably to the regulations on this subject, when rations or messes are furnished for men not in hospital, or under such further regulations as circumstances may render expedient.

17. The regulations respecting hospital stoppages from Europeans, as detailed in section 5, are applicable to and are to be particularly attended to by the medical officers in charge of field general hospitals, and when men are discharged from them they are, as in regimental hospitals, to be furnished by them with the regulated certificates.

ARRANGEMENTS IN THE FIELD BEFORE AND AFTER ACTION.

18. When the force to which a medical officer is attached is placed under circumstances rendering it likely that in the course of service it may be engaged with an enemy, the medical officer will arrange with the adjutant, or staff officer of his charge, for the attendance at the hospital or his own quarters of the band men, to the end that they may be by him instructed in the application of field tourniquets.

19. He will explain to them their use, mode of application, &c., and will satisfy himself that they are in so much fitted for the duties they may soon be employed in.

20. While the troops are moving on, medical officers will follow their respective corps with all the empty sick carriage, &c., but as soon as they deploy, or form for action, all, excepting one medical officer for each brigade or body of equal strength, will move a short distance in the rear, out of the range of musketry, and will there make their preparations for succouring the wounded, and performing any operations that may be then necessary; cordials, &c. should be at hand, and all instruments and dressings, &c. ready to be used.

21. In the rear of each brigade and within range of musketry, one medical officer (in general, an assistant surgeon and the junior present) will, as above stated, be stationed for the purpose of checking any alarming hemorrhage, and expediting the removal of wounded men to the stations in the rear.

22. For this purpose the doolies and other sick carriage will be placed under his orders, and the band men and others will assist the wounded from the ranks to the place where the medical officer is stationed, and from thence into the doolies.

23. To all the band men and others employed in this duty field tourniquets should, previous to the action, have been issued. No men are to be allowed to go into doolies who can possibly walk to the rear.

24. The surgeons or medical officers of regiments are, as has been stated, to be stationed at a short distance in the rear, but out of the range of musketry, and there the wounded will be dressed, and all cases requiring immediate operations be attended to; at these posts bheesties with water will be placed, and from thence all men sent to field general hospitals will be despatched.

25. These posts are to be in as sheltered situations as possible, and if not very easily seen, to be distinguished by some flag or other conspicuous object.

26. If any town or village be situated in the rear not far from the scene of action, in which there are houses or buildings calculated to receive wounded men, straw, &c. for bedding, and abundance of water, &c., should be provided and kept in readiness for them, and to this at least all those severely wounded ought to be removed.

REMOVING SICK OR WOUNDED TO THE REAR OR TO FIELD GENERAL HOSPITALS.

27. The quantity of carriage rendered disposable by the consumption of stores of every kind is invariably to be notified to the deputy inspector-general, or medical officer performing his duty with the force, or in their absence to the medical officers with corps, to the end that it may be taken advantage of in the transport of sick or weakly men; and in the same manner when carriage so rendered disposable is sent to the rear, it ought to be employed in the conveyance of men to field general hospitals.

28. By taking advantage of these opportunities the force can be easily disencumbered of its chronic cases.

29. To enable deputy inspectors-general and medical officers to perform this part of their duty without inconvenience, the place of destination, with notice of the exact day and hour when such carriage is to proceed to the rear, ought to be intimated to medical officers.

30. In addition to those means of moving sick to the rear, or at times when these do not exist, advantage must be taken,—

1st. Of the doolies and sick carriage belonging to their charge.

2nd. Of transport belonging to the country.

31. When it can possibly be avoided, the first ought never to be detached, unless for short distances, or excepting when stores of some description, such as medicines, instruments, &c., are to be brought up from the rear; and in both these cases the most positive directions should be given for its immediate return.

32. The transport of the country should be divided into classes, as doolies, cots, &c., for those unable to ride or go in carts, &c., and carts, bullocks, &c., for the slighter classes.

33. Medical officers must always, in person, class off their sick, and apportion the different modes of conveyance for individuals.

34. When water carriage is to be had, it is incumbent on the medical officers to ascertain whether the boats are decked, open, or capable of being protected by awnings, and the cases should be allotted to them according to their condition.

35. Regimental surgeons should be directed to take advantage of every opportunity which offers for sending to the rear their chronic cases. Acute cases should be kept as long as possible with their regiments, or at least so long as there remain any symptoms to subdue.

36. No case should be sent to the rear for reception into field general hospitals which can be conveniently treated in the regimental hospital, with the probability of the soldier soon being made effective.

37. All convoys of sick sent to the rear should, according to their magnitude and the importance of the cases sent, be accompanied either by a medical officer or subordinate medical servant.

38. They ought to move at proper hours and by such routes as may have been laid down for them.

39. Care should be taken that every sick soldier sent to the rear has his blanket, watch cloak, warm clothing, and knapsack with him.

40. In case a subordinate medical servant only be attached to the convoy, he is to report himself to any medical officer that may pass him on the march, and in any case of difficulty is to request the assistance and advice of any medical officer who may be within reach.

41. The medical officer into whose charge the subordinate medical servant will deliver the men is to report the state in which they were received, with any casualties that may have occurred on the way.

42. During any halt of the convoy the clothes and bandages, &c. of the men ought to be well washed and aired, &c., and the persons of the men themselves should be made as clean as circumstances will permit.

FIELD SERVICE ALLOWANCE OF FIRST AND SECOND CLASS SERVANTS.

—	For a European Regiment.	For a Native Regiment.
Apothecary - - -	1	—
Steward - - - -	1	—
Assistant Apothecary - -	1	—
Apprentices - - -	—	—

Field Service Allowance, &c.—*continued.*

—	For a European Regiment.	For a Native Regiment.
2nd Class.		
Serjeant	1	—
Dresser	1	—
Matron	1	—
Assistant Matron	1	—
Writer	1	—
Compounder	1	—
Store Servants	2	—
Shop do.	1	—
Ward Coolies	10	—
Bheesties	5	—
Dhobies	3	—
Tailors	2	—
Sweepers	5	—
Head Cook	1	—
Assistant Cook	2	—
Leechman	1	—
Barber	1	—
Dooley bearers	10	—
1st Class.		
First Assistant	—	1
Second Assistant	—	1
Apprentices	—	2
2nd Class.		
Sweepers	—	2
Bheesties	—	2
Goorgah	—	1
Cook	—	1
Dhobie	—	1
Dooly bearers	—	5
One Dooly to	20	100
One Spring Cart to	100	500

Doolies are intended for the worst cases, spring carts for those not so seriously ill or wounded.

An additional dooley and spring cart are allowed when the strength exceeds by more than one-half that entitling to one of each.

Doolies and spring carts are supplied by the ordnance department on indent; dooly bearers, all other sick carriage, and carriage for hospital stores are furnished by the commissariat department on indent.

Separate indents are required for carriage for the sick, as dooley bearers, &c., and for carriage for hospital stores, &c.

Commanding officers can indent on the commissariat for extra sick carriage to the extent of five per cent. of strength, without special sanction of the commander-in-chief. Indents in duplicate must specify the nature of the sick carriage, its necessity under certificate of medical officer, period for which required, &c., countersigned by the deputy inspector-general; and if no commissariat at hand, by obtaining the necessary carriage otherwise and charging for the same by contingent bill.

Appendix 2.

From D. Grierson, M.D., Surgeon Major, Staff Surgeon to the President of Committee on Questions of Royal Sanitary Commission.

Sir,

I have the honour to request of you the favour to transmit along with the information furnished by the Committee the following observations, made on my part in accordance with the permission granted in the last paragraph of the instructions issued for the guidance of the Committee.

2. Were this the first time I had turned my mind to the considerations about to be entered on, I should think it presumption to submit them now. The case is different; and as with me the subjects have both a history and a special character, I shall proceed to deal with them in a chronological order, as well as in an expository method.

3. The subjects I wish to speak of are intemperance, prostitution, accommodation for troops, and medical police.

4. From October 1832 till July 1835 I served in the Indian Navy, and observed facts connected with the issue of spirits to the men which led me to submit a statement on that and other subjects to the Superintendent of the Indian Navy, then Sir Charles Malcolm, and to urge a diminished supply. The reply was, "In every part of your "arrangement regarding the allowance of spirits, the super- "intendent fully concurs, and it is very satisfactory to him "to have so many proofs adduced as you have done in "favour of a reduced quantity." In the year 1838, in connexion with a detachment of Her Majesty's 40th regiment, the subject was again forced on my notice, but without practical result. In regard, however, to the canteen system, and especially that part of it which provides for the accumulation of profits by the sale of spirits, and the expenditure of these profits for what were called charitable objects, the note I made of it was, "Thus, by a most sin- "gular arrangement, the very vice of the soldier is made to "provide for him in the day of his misfortune, and he is "tempted, under the delusion that what he spends is not "all lost, or at least benefits others, to part with his money, "ruin his health, and acquire those habits which may ren- "der him a torment to others or effect his own destruc- "tion." Since those days indirect ways have been taken to diminish the taste for spirits and the use of them. It was, indeed, before that time, namely, in the year 1830, that spirits, as part of the soldier's ration, had been abolished; but in 1847 the introduction of porter and beer was intended to promote the same object. Coffee shops are strictly enjoined by the canteen regulations, and regimental libraries have been established, and have been justly thought to conduce to the same result; and to these means, and in the same category, are to be added ball alleys, skittle courts, and work shops. While these indirect methods have been tried, it would seem as if it were not generally known, to judge by one of the questions put by the Commissioners, that the more direct voluntary plan of temperance societies had been discouraged and suppressed in the army. This was done many years ago, and in consequence no means at present exist to enable any one to supply a comparison of the ratio of sickness in abstainers and among those who use spirits. But comparisons of this kind were made in former years, and it may be well to produce one of them. The following statement is taken from the *British and Foreign Medical Review*:—"A temperance society was established "in the Cameronian regiment in 1837 at Fort William. "The surgeon, Mr. Bell, reports most favourably of the "results. The admissions into the hospital were, of the "society, 1 in 25, of the rest of the regiment 1 in 11. The "deaths in the regimental hospital were, in 1837, 26, and "in 1838, 22; whereas for 14 years previously the mortality "had been nearly 72 per annum. The consumption of "spirits has diminished from 14,000 gallons (which was "the amount consumed on the arrival of the regiment in "India) to 2,516 gallons. Liver complaint has diminished "from 111, 140, and 135, as in 1832, 1833, and 1834, to 82 "and 50 in 1837 and 1838. It also appears that by tem- "perance two-thirds of the sickness has been removed."—Ed. *M. Jour. of Med. Science*, No. VI., June 1, 1841.

To this exhibition of facts, the result of abstinence, it is impossible to add force; neither can one forbear to deplore that so promising a movement was nipped in the bud. This is not the place to offer many remarks; yet it is desirable to allude to other changes. It was thought a very great and beneficial advance when in 1830 Lord Hardinge, then Sir H. Hardinge, abolished the spirit ration; and this merited the commendations it received when spoken of as an act of wisdom and courage. Perhaps but for this other measures would have followed more slowly. Be this as it may, in 1837 good-conduct pay became an institution; in 1844 savings' banks; in the year 1846 flogging was limited to 50 lashes as a maximum; and in the following year the sale of spirits, as distinguished from the issue, was put a stop to in canteens; service on enlistment was limited to 10 years; and regimental schools were introduced.

A century and a half ago, that soldiers were a body of men distinct from the body of the people, governed by different laws, whose only principle was blind obedience, and that they could not be made obedient to the allurements of rewards, as coercion, generally speaking, is the surest principle of all vulgar obedience, were approved maxims; and at a much later period it was publicly stated that "the "worst men were the best soldiers." The changes above alluded to are evidences that the ancient prejudices and practices of an evil day are gone for ever; but the question is, what effect have these changes had on the habits of the soldiers as regards drinking? It may be conceded at once that they have been beneficial; that they have not gone far

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enough there is reason to believe. I take up a medical journal published last year, and I find that in one regiment three canteen serjeants perished of *delirium tremens* in 18 months. The surgeon remarks, "The canteen serjeantcy "seems to be allotted as a kind of reward to the steadiest "and best men of the longest service, whose previous good "conduct, however, seems literally unequal to the great "temptation of a free access to liquor." This reminds one of the maxim, *Nemo mortalium unquam fuit repente turpissimus.* I have seen within three years one soldier brought to hospital a corpse who, drunk, a prisoner, and being taken to the guard-room, tried to escape, and was killed on the spot by one of the guard, who threw his bayonet at him; and I saw another who had just been killed by a drunken antagonist, with whom he had retired from the barracks to end a brawl by fighting. Within the same time, in one year, I treated for *delirium tremens* 10 men in a company of artillery of about 100 strong. The staff hospital receives the warrant officers of the arsenal, commissariat, and brigade-major's establishment, the men of which departments, it is believed, may be considered the picked men of the service; yet from amongst them, a small class, in the last four years there have been 9 admissions for *delirium tremens*, and one of these members of this class perished in this horrible disease. In mentioning these men, I have chosen, as a proof of drunkenness, extreme cases; but this procedure, the only tangible one, is open to no objection, for every case of *delirium tremens* represents, besides a deplorable individual instance, an undefined but certain amount of drunkenness—it may be 10, 50, or 100 to 1. Proofs, however, are scarcely needed, for I suppose no one conversant with the subject will deny that the great majority of military crimes owe their origin to the love of drink or the consequences of indulgence in it.

It remains to inquire if anything can be done to lessen intemperance. The preceding narrative points out temperance societies as an efficient beneficial agency, and these ought to be encouraged. Men are influenced by example. Example derives force from numbers. A society developes this force and displays it, and is a quiet antagonist of drunkenness and a protest against it; it is a rallying point, and will always attract some to support the cause it represents, from amongst those who esteem it more noble to overcome evil with good than to be overcome by it, and better to assume an attitude of opposition to this special evil than to be indifferent. Instruction, amusement, and occupations are all subsidiary means of raising the character of the men, and enabling them to despise debasing pleasures and resist seductive habits; and it ought to be be received as a maxim that when any one is addicted to vice, unless a feeling of opposition to it be raised in the man's own mind, prevention will only stimulate ingenuity, and punishment suggest greater caution in the means and measure of indulgence; but the eradication of drunkenness from the army depends not on desultory indirect efforts. It must be the result of a system; such a system, it is conceived, is possible, and has nothing of an active or aggressive character about it; it has rather a negative character. Its chief feature is to let the men alone, and if evils arise from this inaction, then it would be required to deal with them as evils. The present system is erroneous and inconsistent, to say nothing of lacs of rupees lost in condemned porter, or of the 5,000*l.* per annum paid simply for coverings of mat to protect the transport boats on the Indus, to say nothing of the impracticable nature of the present plan in time of war, or the huge monopoly. Spirits were at first allowed to soldiers on the wrong principle, that the addition of spirits improves the quality of the water when bad, or makes it innoxious when hurtful, and what was granted at first as a bounty was soon claimed as a right. There is neither room now for the illusion nor ground for the claim of right, and what is wanted is that the State cease to be a great hotel keeper, and abandon all those allurements to their customers, such as charitable donations out of the canteen fund, the provision of balls, quoits, and other necessaries for games and amusements, supplied from the same source, which throw a covering over the nakedness of the system, and impart to it an interest not rightly belonging to it. Until this is done there is an inevitable inconsistency in the fact that Government supply, as every one must allow, daily opportunities and means of drinking to the soldier, and, as most think, really train him in many instances to become a drunkard, and then punish him when his passions, habits, and infirmities lay him open to faults and negligences, or stimulate him to more active crimes. Let Government abolish the canteen, and stand aloof from the provision and sale of liquor, and then the officers of Government can come in contact with offenders, not only without embarrassment, but deal with them strengthened by the awe inspired by a just and venerable authority. In this case in all its functions Government would be in direct opposition to drinking habits, as well as the evils they lead to. The contrary is exemplified now. Liquor paid for by the soldiers is provided by Government, and though paid for by the soldier, yet access to it is a privilege, the privation of access a punishment; and by restrictions and indulgencies, multifarious interferences, minute and misspent care, a fictitious interest is created in what ought to be left to stand simply in its own nakedness and ill desert. Not only in dealing with crime does the present system lead to embarrassment, a prior charge lies against it, as it affects moral responsibility. When drink is provided by Government, when peculiar advantages are procured to the soldiers by the profits of drink, human nature were no more human nature if drinking, accompanied with so many adventitious recommendations, were not the rule in a regiment, and if example, so highly commended and sanctioned, did not beget an imperious fashion, and lead young and old, with exceptions no doubt, captive at her will. In this state of things young soldiers are scarcely left free, especially after the punishment like privation of liquor, while at drill, and surrounded by influences, all of which appeal to them in behalf of the practice, it is no wonder if the soldier soon learns to drink, and falls a prey to a habit which soon gets beyond control. To redress evils of this kind once fostered is impossible; to prevent them for the future demands, and is worthy of, the greatest solicitude, and the means to accomplish this end, as before stated, seems to me to be that the Government stand aloof, that no dazzling halo be cast around drinking practices, and no sanction be lent to what is too often a commencement of moral delinquency, and what must be often dealt with in its results as a crime; besides, when the soldier has neither sanction nor facility for drinking provided, he is fairly and honourably cast on his own responsibility, his interests are in his own keeping, he is dealt with as a man, not a pupil; his noble instincts are appealed to, he yields to the appeal, and instead of a descent of progressive debasement, he enters on a course of progressive amelioration. The result of this negative action on the part of the Government will immeasurably benefit the soldier, add strength to the army, shed lustre on a wise administration, and remove a national reproach.

As there is always a presumption in favour of established usages, so no innovation upon them can be proposed that is not met by objections. Possibly some may yet urge that alcohol gives strength and adds to productive energy; some less probably may say that alcohol protects from diseases to which soldiers are exposed, especially fevers. These were once favourite arguments, but if pressed by the fact of ill consequences resulting from drinking, the advocate of alcohol would profess to obviate them by proposing the dilution of spirits, or substitution of beer and porter for spirits. But as these measures have been tried and drunkenness yet exists, the great, if not only argument, now is, that the canteen secures good liquor, and if done away with the men would resort to shops or taverns where bad liquor would be procured and the health of the men injured. The reply to this is the difference implied in the terms good and bad, when used in respect to liquor, is not what the words themselves signify. It is a difference not of contrast but comparison, not of kind but degree. Whatever change would follow, therefore, in regard to liquor, is one not absolute but limited, both in the quantity of liquor and in the effects produced by it. It may next be observed that soldiers do not use bad liquor rather than good as a matter of taste. They use what is cheap and easily procured. A monopoly, if it secures a good commodity, compels unscrupulous men to seek hazardous and precarious gain by illicit and spurious substitutes. Competition, by bringing the good commodity to a lower level, cuts up the root of the illicit traffic, and the measure proposed, therefore, contains, in itself, the remedy for the evils alleged as likely to follow it, or rather will prevent the occurrence of them. But again, the objection has no force, for this reason, crimes and disease exist already in the regiments; either, therefore, these evils originate in the canteen or they do not; if they do, it is a reason to abolish them; if they do not, they arise from sources beyond the limits of the regiments, and if so, and this will hardly be denied by any one, then the very evil dreaded exists already. Illicit liquor is procured by illicit means, and the health of the men injured by spirits used beyond the prescribed degree. The objector then must show, not that men would get bad liquor, but that they would get it worse or in greater quantity than they do now, but this he cannot show; on the contrary, it has been rendered evident that were the canteen abolished, the evil would be diminished or cease.

The conclusion come to then is, that the canteen should be abolished, men left free to drink or not as they choose, the military crime of drunkenness discouraged, and, if need be, punished, and drunkards, if they be found under the new system, weeded out of the army.

Prostitution.

In the letter before alluded to, addressed to Sir Charles Malcolm, attention was directed to a practice which had long existed in the Indian navy. What I mean is the countenance of prostitution. When a ship was in harbour boats might be seen in the evening lying near full of prostitutes, when, at a given signal, permission being granted to come alongside, the sailors might then be seen rushing to the boats, each to select his partner for the night, as a butcher might be imagined to select fat lambs from a flock. This fact is valuable as an indication of public opinion, but I mention it to the credit of Sir Charles Malcolm, that a system so abhorrent to right feeling, and so prejudicial in many ways, was no sooner thus officially brought under his notice than it was abolished.

Again, about the year 1840–41, being then a regimental assistant surgeon, I pointed out the evils resulting from the residence of prostitutes in bazaars, the suffering to individuals induced by it, the loss to the State, and the advantages that would result from their expulsion. My representations, I believe, never reached head-quarters, but were met by the military authority, and resented as an interference with what did not concern me, and by the medical, as being a matter with which it was not felt there was any call to meddle. It was but three or four years before this that the lock hospitals, so called, had been abolished by order of Government, at the instance urgently repeated of the Bishop of Bombay, and supported by the strong arguments of the then Metropolitan of India. Regret was very generally felt and often expressed at this abolition; hence the indifference or hostility with which any further step was encountered.

It was not till lately, about two and a half years ago, that I felt again disposed to take up or justified in referring to this matter in an official manner. In an evil hour, and in ignorance apparently of what had been done in former times, in the extinction of *Lal Bazaars*, and of the late orders of Lord F. Fitzclarence, it was resolved to institute what was called a venereal dispensary at Kurrachee. I will not relate the history of this short-lived institution. It is my object rather briefly to show the objections I entertained and urged against it. It was pointed out that for 500 years at least the law of England regarded the prostitute as a criminal, that this was also the law of India, by the enactments of its Supreme Council, and that it was the law of the military bazaars of the Bombay Presidency; that the object of legislation has uniformly been not the regulation of an admitted evil, or the protection in any way of those who favour or commit it, but the punishment of the offenders and the suppression of the crime. It was shown that Christianity condemned prostitution, and the remonstrances of Bishop Carr and of Bishop Wilson were quoted which they urged against lock hospitals. It was then added, what is rooted in religion and embodied in law must also be seated in human nature, unless indeed the first be fictitious, and the second usurp a power and an office where neither are rightfully due. But this conclusion cannot be drawn in this instance; for so long as modesty, integrity, self-restraint, honour, chastity, are reputable qualities of the individual, commendable and excellent, so long must it of necessity be that the dissolute, those abandoned to the sway of one of the basest passions, the sexual appetite, shall be held as evil-doers, corrupt and corrupters by practice and example, enemies to social well-being, fallen or who ought to fall from the privileges, protection, and enjoyments of society. It is the voice of reason and of nature, that if we would cherish whatever is loveliest and dearest in our estimate of human character, we must set the stamp of reprobation on all that tends to diminish its production, to render precarious its continuance, to impair its lustre, or to annihilate its existence. Nature, religion, and law, then, all concur in visiting the prostitute with their peculiar penalties—moral, spiritual, and legal, and heavy is the responsibility of those who lightly set them aside. To do so, in truth, is to take the opposite view altogether, for if we once depart from the wholesome principle of viewing the prostitute as a criminal and as a violater of moral law, what little soever notice we bestow, it is countenance bestowed; and how little soever we regulate her affairs, it is protection and reward.

But it might be objected,—it is not reasonable to deny the woman aid in her distress, any more than to forbid assistance to be given in any case where the imprudence of the sufferer has been the occasion of his malady. To this it is replied, all sufferers from disease, though themselves the cause of it, address an irresistible claim to the sympathy and aid of the physician. On this there is, there can be, no dispute. Patients suffering from *delirium tremens* are cared for with the greatest solicitude; and so are women labouring under venereal disease, nor is less done for the greatest of all criminals, the man who with sacrilegious hands has violated in his own person the sanctuary of life. But no rational man can fail to have some respect to the consequences of his acts, and in the instances advanced, or any other of the like kind, when a comparison is instituted, it is easy to see that a special peculiarity attaches to the case of the unfortunate female. In other instances, the victims of self-inflicted disease, when restored to health, are thrown upon their own responsibility. The health and improved condition they have gained form no necessary preparation for the unavoidable issue of renewed vicious indulgence. The lesson which teaches the connexion of vice and suffering has been brought home to personal experience; on this may be grounded an exhortation and appeal to a mind consciously awakened to see the nearness and magnitude of a danger hitherto little appreciated; and the conviction which springs from these truths is happily found to be not always unavailing. But the restoration to health of the female is the very condition of the resumption of her nefarious occupation, and, qualified again as she is to this resumption, her necessities impel her. She may feel the sense of responsibility keenly, may weep over the past experience of her sorrows, may shudder at the prospect the future offers to her; but we have qualified her to tread the path she trod before, taken from her the provision she got before, and that thorny path she must tread again. Now to warn, exhort, dissuade from evil in such circumstances, if that be all we do, is little better than hypocrisy, and means little else than reproach. And we see ourselves reduced to this extremity, that either we must act in a way outrageous to humane feeling, or, by our silence, though accompanied with inexpressible pain, seem to countenance a course which we abhor.

It may be worth while to illustrate this point by way of analogy. Those who suffer injuries in following occupations and trades are humanely cared for, and treated at public expense or by private bounty. When the endeavour fails to restore a useful member of society to his place and functions; a debt is paid to the unfortunate, and compassionate feeling is satisfied. If the result be more fortunate, a benefit is conferred in the restoration of a useful member to society. Suppose, however, a society of mistaken philanthropists followed an army to cure the wounded of the enemy, and restore them to their friends again, to fight against the country of their benefactors, this conduct would be absurd, and the humanity of it would be lost sight of, in the contempt and scorn, or direct opposition which would be turned against so unwise and unpatriotic a procedure. Or again, imagine a state of civil disorganization where thieves and burglars should often meet in conflict a feeble police, and where wounds and severe injuries were frequent. Imagine, further, that a benevolent society were constituted to shelter, provide for, and cure these lawless combatants, and when cured to dismiss them to pursue their disorderly life, would not the act of humanity be forgotten in the indignation felt against those who evaded the law, harboured, aided, and encouraged the disturbers of the peace, the enemies of the public safety? But these fictitious cases are similar in principle to the institution which should simply take charge of the prostitute when unable to follow her unlawful occupation, feed, clothe, shelter, cure her, and then, as soon as fit to resume them, dismiss her to fall again upon her evil practices. Hence the conclusion seems just and reasonable, let there be simply a dispensary or hospital opened, provided with necessaries and the requisite attendants for the reception and cure of women who live by prostitution, and become diseased by following this mode of life, where shelter, care, and cure are all gratuitous, and the condition of obtaining the advantage of them is the attendance or residence of the applicant; let the plan be as remote from the continental system of Europe, registration, domiciliary visits, compulsory inspection, and medication, as possible, and as consistent with the liberty of the subject and the protection afforded by law as can be desired; still there attaches to the modified scheme a character, the vices of which exclude it from the category of legal institutions, and bid away from it the cold approval the moralist and philanthropist would feel disposed at first sight to bestow upon it.

But it is not alone by an appeal to fictitious analogies, or by the assertion of undeniable principles, that we reach this conclusion. Tried by practical application, the institution and the associations it provokes challenges only reprobation. This point was put forward in reference to the establishment set on foot at this place, and I desire it should be pointedly mentioned, that nothing has appeared in public to tend to the belief that, though the establishment at Kurrachee was abolished, yet similar establishments do not exist at Poona and Belgaum to this hour. The remarks to be repeated here, therefore, have a living interest at this moment. Were it otherwise, yet their repetition

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is desirable, for it seems as if most minds never contemplated any other means of abating the evils of the venereal disease amongst troops except the establishment of lock hospitals, and the proposal is continually coming to view, put forward, it is believed, by men who not only know nothing better, but have never heard of any other plan or possibility of dealing with an admitted evil, a detriment, and reproach. Speaking in regard to the establishment of a venereal dispensary at this place, it was said, these things are done, not in accordance with any known law, but in opposition to it. Women of disreputable character the law enjoins should be expelled from cantonments; but this is not done. They are countenanced and permitted to remain. When sick, they are lodged, fed, and receive care and medicine at the public expense, as if they were valuable members of the community, or servants of the State. And what a contrast do the industrious and decent inhabitants, as respects their treatment or the neglect of their necessities, afford! It was proposed to take their school from them for the accommodation of their vicious neighbours. When sick, what care do they receive? A few applicants and an occasional inmate, of the female sex, are seen at the general hospital; but let returns of all the hospitals in Sinde be called for, excepting at the same time the patients in jail, and perhaps not half-a-dozen will be found. Again, I have attended, in the dwellings of the native poor, women in child-birth, some of whom I am certain, as one can be in such matters, but for help must have died, and some of whom earlier relief would have saved from death; but who ever heard in the provinces, and only lately at the presidency, of a maternity hospital, an institution than which few could be more desirable, and none bear a higher stamp of Christian philanthropy? In plain terms, and this statement in its general extent cannot be denied, the vicious, whom law, religion, and morality condemn, receive indulgence, protection, and support in their necessities from the public money, while the honest, industrious, respectable, however necessitous, are not thought of, or viewed with unconcern, apathy, or contempt.

If we inquire what effects such a practice is likely to have on the minds of others, we shall find it far from salutary. The woman is encouraged and confirmed in her evil courses. The soldiers are countenanced in crime; and if they contract disease will be apt enough to reproach the Government which has held out a false hope of immunity. Decent inhabitants cannot but be perplexed, when they think that a Government, which in principle approves of honesty and industry, should yet make its especial favourites the impure, the corrupt, the disorderly; and in their bewilderment they will probably lose what little hold on their confidence and affection, as nature and duty teach them, the rulers of the country are entitled to and enjoy. Nor is it impossible that the parents of Christian youth in the cantonments look with dread on an establishment where the modesty of tender years may be endangered and vicious habits contracted under sanction of authority.

But as respects the soldier, who rejoices not in his improved condition of late years? Who is there who sympathizes not with every regulation directed to his elevation and well-being as a man and as a Christian? And not a little has been done, and with no little effect in late years. The schools in regiments, the Ten Years' Enlistment Bill, good-conduct badges and pay, all indicate the same purport, and tend to realize the same desirable result. All address themselves to his capabilities of improvement and moral elevation, and all are intended, by bettering the condition of the soldier, to raise the character of the service, facilitate the supply of men to constitute an armed force, and to make that force when constituted more valuable and efficient. Now the institution under review is not in harmony with these regulations and usages. It does not facilitate their action, but is opposed to them and detrimental. The dissolute soldier, the man under the tyranny of lust, is the discontented, needy, dishonest, drunken, untruthful, quarrelsome, disobedient, and negligent soldier; and this institution is designed for men like these, or will make men like these. The good can have no benefit by it. Their concern with it is to deplore its existence, and regard it with alarm and abborrence. It is therefore the antagonist of the school, the church, the reading room, the playground, and every thing which is brought into use or may be brought into use to make the soldier an instructed, a contented, and a happier man. I can conceive the incredulity with which those who best love the soldier, and most earnestly, consistently, and successfully seek his amelioration, would hear of an institution like this being organized in these times (May 1858), and at this time of day; but I cannot conceive the horror with which many would receive the evidences of its existence.

If it should be asked, how then deal with the offenders in the bazaars of this class? The answer is, as the law directs. Expulsion is that law. If it be objected that this is cruel, that evils will follow it, as well might it in any case be said that justice is cruel, or the law tyranny. Execution of the law occasions distress, gives rise to evils; but execution is not a daily office, and it is enforced that greater distress and greater evils may be anticipated. And as for evils to come, the fallacy is easily exposed. We must not do evil that good may come is an admitted truth; as we must not do good lest evil may arise is an oft-enacted fallacy. The good in the latter case is positive, the evil only contingent, and if the evil comes, for every wrong and for every evil there is a remedy. The course therefore is plainly marked, and if we believe in a moral governor of this world who delights in goodness, we cannot refuse to acknowledge that in this very faith he has given us ample encouragement to prosecute what is good, and just reason to think that he will favour the good and set his face against all that is evil.

It has been already shown how repugnant this establishment is to law, religion, and morals, and it is not meant to recur to that view of the subject. But to cut off all objections, if there must be an institution for the care of prostitutes, it is desirable to indicate the principles on which it might be legally founded and honourably conducted. Examples of institutions of this kind are seen in Great Britain and Ireland, and the great Scott, the commentator, was chaplain of the London Lock Hospital. These institutions are signalized by the aspect of reform of character as much as by that of punishment. The law does not forego its claim to deal with prostitutes as criminals, but religion steps in and deals with them, and tries to make them penitents. By the various names of Magdalene asylums, lock hospitals, penitentiaries, and such like, these houses of correction are known, and the objects common to all are by sobriety, cleanliness, and medical assistance, by a regular series of labour, by solitary confinement during the intervals of work, and by religious instruction, to preserve and amend the health of the offenders, to inure them to habits of industry, to guard them from pernicious company, to accustom them to reflection, and to teach them the principles and practice of moral and social duty. Institutions like these are within the bounds of law, are approved by reason, and sanctioned by religion. Institutions with attributes like these are schools or churches, as well as jails. But to aggregate prostitutes in a public building and give them public support where no such attributes hallow the scene, is to constitute neither a church nor a school nor a jail, but a brothel.

Another letter by way of supplement was afterwards forwarded. In this I took occasion to quote the recorded opinions, or, in one instance, oral testimony, of Lord F. Fitzclarence, Sir Bartle Frere, General Jacob, Colonel Edwardes, and Sir John Lawrence on the subject in question, and this weight of authority was thrown into the scale which bore the condemnation of the lock hospital system. Lord F. Fitzclarence, through the Adjutant-General, announces his views thus:—"I am directed to intimate that after "giving the whole subject his best attention, his Excellency "concurs with his predecessors in command of the army, "that police measures for preventing the infection of the "soldiers with the venereal disease cannot be carried further "than therein ordered (this alludes to orders for expulsion) "without involving the certain degradation and oppression "of many women of respectable character, and occasioning "other evils which in his Lordship's opinion would be "much greater than that which it is the object to remedy." General Jacob, amongst other remarks, makes the following:—"I would not interfere with these women in any way, "and although it might be good policy to provide dispen-"saries or hospitals, to which such persons might resort if "they chose, there should be none specially set apart for "them. The proper and only wise method of reducing "this disease is to improve the condition, the state of moral "being of those who resort to these women. Coercion of "every kind always increases these evils. Moral forces "alone are of any value." He adds, speaking of the Sinde horsemen, the elder, graver, and better part of the soldiers, seven-eighths of the whole number probably have their families here, and do not resort to public women, except when they employ them at nauches, &c. &c. Colonel Edwardes and Sir John Lawrence both concur in the propriety of expulsion of prostitutes, and signalize the restriction on marriage amongst the English troops as a great evil and hardship, and assert that married men are the better soldiers, and women and children no impediment in time of service, as they are left in cantonments.

To this weight of authority, it was said, I would add one or two facts. The 4th company of reserve artillery at present stationed here (1858) I have had charge of for 14 months, and the strength, inclusive of men attached from other companies at Hydrabad and Shikarpoor, has been the

average of 107 men per mensem. Of primary cases of venereal affection there have been treated 13, which by calculation gives for 1,000 men per mensem for one year 111 cases. I have had charge also of the depôt 1st Fusiliers for nearly 19 months. Of these months I omit the first, as it represents the whole regiment not the depôt. The strength for these months is 95, as in that time about 150 recruits passed through. The primary venereal affections in these 18 months are 20, which by calculation would give per 1,000 per mensem in the year, cases, 140. The mean of the Artillery and Fusiliers is 125, which divided by 12 for 12 months gives an average of admissions per mensem in a European regiment 1,000 strong of 10½ nearly. I served for five years with a native regiment, the 1st Grenadiers, an abstract of the return of which I have now before me. The strength was 781 per annum, the number of primary venereal affections amongst the privates (there was not one amongst the native regimental officers) was 77, the annual average was therefore 15. This by calculation for 1,000 gives admissions 19 per annum, and per mensem $1\frac{7}{12}$. When we compare, therefore, the condition of a European regiment and of a native regiment in this matter of venereal infection, the native regiment appears to a greater advantage, by five times over, than the European. And it will be extremely difficult to find any satisfactory explanation of this deplorable fact, other than that in the European regiment marriage is restricted and widows unkindly used; whereas in the native regiment marriage is free, and the native soldier's family generously treated.

It was already stated that these representations were followed by the destruction of the ill-featured institution which was set up here. But whether its congeners at Poona and Belgaum shared the same fate has never, I believe, been made public. If these exist the reasons urged are as applicable to them as they were in the instance which gave rise to them. But the subject would be imperfect indeed if we stopped here. The system is called for, it is not said wisely called for, because of the deep pervading power of the sexual passion, and the evils which arise from its promiscuous indulgence. Now the wisest law that ever was promulgated on this subject, the only one which deals a deadly blow at the heart of the vicious and debasing crime in question, is the simple one, "Let every man have his "own wife, and every woman her own husband." How complex, how difficult, how unavailing all other legislation on the subject except this, and this how plain, how obvious, how admirable! This law, however, has been set aside; there has been wailing in families, and immorality in public places, because this law has been set aside. The British public though late, has recognized the fact, and sympathises with those who are sufferers by it. The Government will not overstep public feeling, but concentrate its action, and gain merited applause if it lends ear to a law which should never have been violated. But the marriage of the soldier will entail additional expense on the public. If it be so, and this may on a comprehensive view be doubted, let the public know why, and it will not complain. Besides, does any one think that the pay of the soldier is ever to continue at the venerable 13 pence a day? Sir Archibald Alison has publicly stated his opinion that the soldier's pay ought to be 20 pence a day. With changed times, is everything to change but the soldier, his pay, his prospects, his happiness? I conclude then that these two principles of the repression not recognition of prostitution, and of the permission not restriction of marriage amongst the European soldiers in India, indicate clearly what is needed in the way of Christian and public duty, and what is best for the elevation of the soldier, as respects morality, health, happiness, and efficiency for the public service. And I add my conviction that this, the true remedy, bounty to soldier, not the prostitute, will, whenever applied, declare itself in its simplicity, perfect propriety, efficiency for the end desired, and the many priceless advantages it will bring in its train.

Accommodation.

In the year 1851 it occurred to me to be engaged in conjunction with others, one of them the Superintending Engineer of the province, in devising the plan of a lunatic asylum for Kurrachee. It then appeared how vague were existing opinions on the subject of space in buildings, and how little information was available from any source to satisfy the inquirer. The subject occupied attention. Sir Charles Napier had wisely insisted on having hospitals and barracks greatly larger than those heretofore in use; but the principle, or rate, to guide to the determination of what the actual space should be, was not to be found. Sir Charles particularly desired height, and had no better reason to assign for the preference than that the doctors would no longer be able to stuff their patients into the corners of the hospitals. This was sometimes jocularly, or perhaps seriously, met by the statement, that we had a tall column of air in dead wells, yet the air sometimes was fatal to those who descended into them. Dr. D. B. Reid had recommended 1,500 cubic feet per man, but this, almost by common consent, was declared an extravagance. In April 1852 it became my duty to make a special report on the jail at this place. The space allowed for patients was very small, and seemed to have been really productive of very bad effects. It was remarked,—"It has not been "hitherto sufficiently considered that a man in 24 hours "must breathe 300 cubic feet of fresh air or sicken. "Were he confined in a space of this extent, without the "access of new air, the process of vitiation must commence "with the first respiration, and the man could not live "in health and vigour for 24 hours. Hence the necessity "of spacious accommodation, and of free ventilation, with-"out due observance of which health cannot be maintained, "disease will be aggravated, and life itself destroyed. In "Europe, a space from three to five times exceeding that "mentioned, or from 1,000 to 1,500 cubic feet, together "with good ventilation, is judged suitable as an allowance "for each individual in any establishment permanently "occupied and the air of which is liable to constant vitia-"tion. And it might be easily shown that the conditions "obtaining in hot climates render desirable an increase and "not a diminution of this allowance." This, however, did not escape without what was meant, perhaps as correction, but looked like animadversion. It was observed, "In re-"ference to Dr. Grierson's special report on the Kurrachee "jail the Board direct me to remark that though the "number of cubic feet of air necessary to be respired in "24 hours by a single individual be stated at a moderate "amount, they are of opinion that that officer rather "exceeds when he talks of 1,000 or 1,500 cubic feet, "together with good ventilation, being considered suitable "as an allowance for each individual in any establishment "permanently occupied, and the air of which is liable to "constant vitiation," at least in practice it is not so, "for "even in the metropolitan hospitals of London, Dublin, "and Edinburgh, in the provincial hospitals of all England, "and in the general hospitals, naval and military, of the "British Government, the allowance is under 1,000 feet; "while to British soldiers in barracks at home and in tem-"perate climates, the allowance is 450 to 500 cubic feet, "increased in tropical countries, in hospitals, to 650 or 700 "feet, 1,000 feet in barracks, and 1,500 in hospitals is as "much as could be desired for each European even in the "tropics." The force of the concluding sentence here, it is presumed, depends on the assumption that the want of the native in respect of air is less than that of the European. Natives generally want less, as pay, for instance, and possibly they may want less atmospheric air; but the fact, I think, has not yet been determined by experiment. This recusancy on the part of the Medical Board is not to be wondered at. Opinions grew very slowly on this subject, and perhaps have not yet reached their maturity. Lavoisier, whose merits are so well known, in the end of last century, pronounced the air required in respiration for one man in 24 hours to be 120 cubic feet. Sir G. Blane, in the beginning of the present century, named 600 cubic feet in hospitals as a minimum, and thought 1,000 not too much. Dr. Bostock, in 1826, quotes with approbation this conclusion, the former had embraced. In the year 1833, Begin in the *Dictionnaire de Medecine et de Chirurgie Pratiques*, under the Article *Hôpital*, assigns 20 cubic *mètres* as the volume of air calculated for fever cases in hospital, and the equivalent of this in English cubic feet is a space of 700 cubic feet; but when he gives the dimensions which should characterize the hospital he approves of, he seems to raise to 1,000 cubic feet this amount of space. About 1844 Dr. D. B. Reid recommended 1,500 cubic feet, and there opinion in England seems at present to halt. However, the authorities of King's College, London, did not adopt that standard, but allow for each patient a minimum of 1,800 cubic feet, and a maximum of 2,400 cubic feet. Besides this diversity and gradual development of views, confusion of thought was occasioned by the connexion subsisting between space and ventilation. In the progress of knowledge events lag behind. Principles always precede their practical application, and even when more enlarged notions of the necessity of increased space began to prevail, there were very strong objections entertained to pulling down small, and then erecting new and suitable buildings. The intention of this increase, it was allowed, was to give fresh air, and this intention it was sought to accomplish, not by increase of space within, but by means of better ventilation from without. Yet no attempt was made to determine in what relation space and ventilation stood to each other. Again, in India, it was often said, rules like these apply in Europe, where buildings are shut up on account of climate, but with us buildings are almost always

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open, are thus ventilated at all times, and the increase of space demanded in Europe is not requisite. To this argument no effectual answer was forthcoming.

It was in the same year, 1852, that I was under the necessity of considering the question again. The occasion was this, I was called on by the Medical Board to report my experience and opinion of the station of Colaba as affecting health, and especially the health of European troops. The subject of space in barracks and accommodation fell thus to be specially adverted to, and it was sought to attain some definite notion, which should assign a just limit to precepts hitherto apparently arbitrary.

In my reply, therefore, in October 1852, I wrote thus:—

"Accommodation is highly important for troops. Besides "protection from the various changes of the weather, space "and ventilation demand more attention than they have "hitherto usually received. The amount of space allowed "to troops on Colaba is not known; but, though recently "enlarged, it may be presumed, if one judges by the views "very prevalent, to be defective still. It cannot be inopportune, at any rate, to say a few words on the subject. "Pneumatic chemistry seems to have been long cultivated "before chemists saw the relation it bore to space in dwellings and ventilation, and the mode of estimating these "which is perhaps the best, is of very late introduction. "Dr. Bostock, who criticises with great care the experiments on respiration made before he published, was aware "of the relation alluded to, but contented himself too "easily by giving an approval of Sir G. Blane's estimate "of 600 cubic feet of space for every man. This allowance "is about twice the amount of air a man respires in 24 "hours. Dr. Reid, when he published about eight years "ago, recommended from three to five times the amount in "cubic feet of the air respired, that is from 1,000 to 1,500 "cubic feet; and it has been very lately announced that "the Hospital of King's College, London, is to have wards "to contain 14 beds, with a minimum of space of 1,800 "and a maximum of 2,400 cubic feet for each patient. "These numbers represent nine times and twelve times respectively the amount of air respired in 24 hours. It will "give, perhaps, a clearer conception of these differences to "state, that a space $8\frac{1}{2}$ feet in length, breadth, and height, "contains a little more than 600 cubic feet. Ten feet in "the dimensions mentioned contain 1,000 cubic feet. "Twelve and one-sixth, in the same way, give 1,800 cubic "feet. For 2,400 cubic feet the space must measure, in "the three dimensions, nearly $13\frac{1}{2}$ feet, and for 3,000, "almost $14\frac{1}{2}$ feet. Two modes have been adopted for "estimating the space required for each individual. Finding the amount of air respired, it has been multiplied a "given number of times, and the product according to the "multiplier assumed as the space required. Thus a late "writer states (*Tomlinson on Warming and Ventilation, London*, 1850,) as follows:—'In the process of respiration a "'full grown man draws into his chest about 20 cubic "'inches of air, only one-fifth of this is oxygen, and nearly "'one-half of this oxygen is converted into carbonic acid. "'Now, allowing fifteen inspirations per minute for a man, "'he will vitiate about 300 cubic inches, or nearly one-sixth "'of a cubic foot of atmospheric air, and this by mingling "'as it escapes with several times as much, renders at least "'two cubic feet of air unfit for respiration.' This estimate gives air respired in 24 hours 250 cubic feet, and this "multiplied by 12, the number stated, viz., $\frac{1}{6} \times \frac{12}{1} = 2$, is "3,000 cubic feet. The other mode is to find the amount of "carbon expired in 24 hours, to calculate the oxygen this "requires to convert it into carbonic acid, and to determine "from this the quantity of pure air necessary to be respired "in order to supply the requisite amount. Thus the same "writer says,—'From a comparison made by Professor "'Miller, of King's College, of the result of numerous "'experiments, it appears that a man of ordinary stature "'consumes in the course of 24 hours 9 oz. troy of carbon; "'that the heat generated is sufficient to boil away 8 lbs. of "'water; that the consumption of oxygen on this process "'is equal to 24 oz., or 19·4 cubic feet, that the quantity "'of air vitiated amounts to 97·2 cubic feet, and the product in carbonic acid to 33 oz.' By the quantity of air "vitiated here is meant the amount from which the oxygen "is wholly withdrawn, which is just five times the oxygen "consumed. But the quantity of air respired is twice as "much; for only one-half the oxygen inspired is consumed "during each respiration. The air respired, therefore, by "this mode of calculation is nearly 200 cubic feet in 24 "hours. Now, nine times this amount is 1,800 cubic feet, "and twelve times the same amount is 2,400 cubic feet; and "these are precisely the results, as they were most probably "the data, used in determining the construction of the "new hospital of King's College, and they approximate "pretty closely to those found by the other method before "explained."

"These are the rules for guidance on a subject scarcely "yet fixed on settled principles, and which, when better "understood, will create a demand for yet greater space in "buildings. It remains, however, to inquire how far they "are consistent with propriety and suitable to the end in "view. The carbonic acid being the most abundant of the "noxious products thrown off in respiration, and most "easily measured, is taken as the basis of the calculations "regarding space and ventilation. The mean amount of "carbonic acid in ordinary atmospheric air is about $\frac{1}{2000}$, or "·0005. The amount in air expired is about $\frac{1}{12}$, or ·083; "and in air vitiated to this degree combustion ceases, and "plants and animals cannot live long. Practically, then, it "may be assumed, that respired air contains $\frac{1}{10}$, or ·1, of "carbonic acid, and this must be diluted 10 times to make "the air safe. Thus $\frac{1}{10} \div \frac{10}{1} = \frac{1}{100}$, or ·01, and this again "divided by 10, or $\frac{1}{100} \div \frac{10}{1} = \frac{1}{1000}$, or ·001, gives the "amount of ventilation needed to reduce the air to that state "of purity that only $\frac{1}{1000}$ more of carbonic acid should be "added to the air, when it would be represented by ·0015 "instead of ·0005. Observing this rule, and taking 300 "cubic feet to represent the quantity of air respired in 24 "hours, to dilute it 10 times it must be mixed with 10 times "the same bulk, or converted into 3,000 cubic feet, the space "to be allowed for one individual. But if it is wished to keep "up a pure air, it must be mixed with 10 times this bulk "again, or 30,000 cubic feet, which shows the ventilation "needed to maintain an atmosphere nearly pure. In other "words, there must be admitted into the space of 3,000 cubic "feet nearly 21 cubic feet per minute of fresh air by ventilation, if the individual confined in it is to breathe an atmosphere which shall contain only three times more of carbonic "acid than the air he breathes originally contained. Or "again, 300 cubic feet, 3,000 cubic feet, and 30,000 cubic "feet, mark the requirements of one individual in 24 "hours for respiration, space, and ventilation respectively."

"These are the conditions necessary to maintain a pure "air according to the data made use of. There are, however, other facts to be adverted to which, wherever they "exist, and some of them always exist, render still more "imperative the claims put forth for space and ventilation. "These it is not needful to illustrate at length; the enumeration of them will suffice. They are a humid air, "high temperature, the privation of oxygen in respired air "as well as and nearly equivalent to the vitiation by carbonic acid gas, and lastly, the watery vapour, laden with "offensive animal matter, exhaled from the skin and lungs "during respiration. The last of these is especially important. It has been stated that 'the odour of the air at "'the top of the ventilator of a crowded room is of so "'noxious a character that it is dangerous to be exposed "'to it, even for a short time. If the air be passed through "'pure water, the water soon exhibits all the phenomena "'of putrefactive fermentation.' To the same cause, also, "is due much of the effect described in the following "quotation:—'In the houses of the poorer classes in "'Russia, where the windows are single, and a number of "'persons occupy a small stove-heated room, a thick icy "'crust forms on the inside of the windows during frosty "'weather, arising from the condensation of the breath, "'perspiration, and the aqueous fumes of candles and "'of the stove, &c. When a thaw comes on, the icy crust "'is converted into water, and a deleterious principle is "'disengaged which produces effects similar to those "'arising from fumes of charcoal. Persons so affected "'are immediately carried into the open air and placed in "'the snow, with very little clothing; the temples and the "'region of the stomach are well rubbed with snow, and "'cold water is poured down their throats, and the friction "'is continued until the livid hue of the skin disappears, "'and the natural colour is restored.' With these effects "we may contrast those of a purer air. For instance, a "manufacturer puts a ventilating fan in his factory to "remedy the evils of a highly vitiated air. The result is, "the people apply for higher wages, because their appetites "are keener, and they require more food. The veterinary "surgeons recommend ventilation for stables, and the "annual saving to the British Government is 10,000*l.* per "annum. The effects of condensed air are very similar, and "perhaps for the same reason, that more oxygen is breathed, "under circumstances favourable in other respects to the "healthy functions of the body. There is felt a pleasant "sensation in the chest; there is increased vigour of body "and of mind, with improved condition of some diseased "states, and more effective performance of some healthy "actions."

"These considerations, with others which need not be "adduced, occasion reasonable apprehension that many "evils in barracks and hospitals accrue to the men from "want of space and ventilation; and in any place, as in "Colaba, where other injurious influences are also at work,

" the respective effects of each separate cause are aggravated " by reciprocal reaction."

Passing on now in the progress of events and the history of opinion, I extract from a public document, namely, *Budget of Public Works of the Presidency of Bombay*, 1857-58, dated April 15, 1857, the following:—" The desirable- " ness of establishing some general rule for fixing the " amount of space to be set apart for each man in the " hospitals of European troops of this presidency was in " the beginning of 1853 brought under the consideration " of Government by the late Lord F. Fitzclarence. His " Lordship considered it of great importance that a fixed " rule on this subject should be adopted and enforced, in " order to prevent overcrowding in hospitals, and also to " enable the medical authorities to know at all times with " correctness the amount of suitable accommodation avail- " able for troops."

" After consulting the Medical Board on the subject, " this Government, in accordance with the Board's recom- " mendation, decided that 1,800 cubic feet per man should " be made the standard in the hospitals of the Bombay " presidency.

" Subsequent to the adoption of the above standard, the " Commander-in-Chief pointed out that nearly every Euro- " pean and military hospital in this presidency was deficient " in accommodation, and required to be considerably " enlarged. In this opinion, which was supported by the " Medical Board, the local Government fully concurred."

With the affirmation of this rule, if it may so be called, which indicates a slight advance in the opinion of the Medical Board upon that before alluded to, the matter rests. Lord F. Fitzclarence died in 1854, and in 1857 the public works were suspended; and in this breathing time it is important to inquire whether the decision come to by Government be adequate to the necessity of the case. In the first place, no mention is made of barracks, and it is presumed the space of 1,800 cubic feet was not meant to be allowed in barracks. If, then, this amount of space be barely sufficient for hospitals, and less be allowed in barracks, then, to say nothing of ordinary occasions, whenever the weather or other cause constrains men to occupy the barracks more than usual, or a greater number of men than usual is put into barracks, the space is too little, and health must suffer. But for hospitals even the space is insufficient. Did this opinion rest simply on my own decision of the question, however firmly and in good faith I might hold it, still I might hesitate to give it prominence; but it happens that I can adduce authority which will command respect. It was shown before that space and ventilation are inseparably connected, and it would not be possible to give dimensions to a building, as a habitation for living beings, which should obviate the necessity of ventilation; in other words, renewal of the air of the interior which supplies the inmates with air for respiration. It is evident also, that for health in buildings, just in proportion as space is small, so is the need of ventilation greater. Now, when 1,800 cubic feet is decided on as the space in hospitals, there is no provision for ventilation, and no one is in condition to say that ventilation is duly performed. It is left to the operation of doors, windows, and some few apertures in the roof or elsewhere, and to the action of the outer air, which of course daily, perhaps hourly, varies, as the temperature, force, and direction of the winds vary. It cannot be denied, then, that where ventilation is so uncertain, and may altogether fail, as in calm weather it must, the greatest limits of space are very necessary; and it will appear yet more evident when the matter is put in another light. In the *British and Foreign Medico-Chirurgical Review* for April 1860, in the article on the site and construction of hospitals, when the reviewer treats of ventilation, he says, "The French hospitals " contracted for a supply of 2,220 cubic feet of air per bed " per hour." But "to give," says Dr. Sutherland, "the " air of a ward the highest degree of freshness, the amount " of air passing through it should be at least double the " amount required by the French hospital contracts, or " about 4,000 cubic feet per bed per hour."

We shall suppose, then, as we have reason to do, that the wards here spoken of allow 1,000 cubic feet per man. Let us next convert the hourly supply into that of 24 hours, which conversion gives for the French hospitals 53,280 cubic feet per diem, and for the proper amount, nearly double as Dr. Sutherland says, 96,600 cubic feet per diem. These sums bear to 1,000, the cubic space per man, the proportion of 1 to 53 and of 1 to 96, that is, in the former case the air must be renewed 53 times, and in the latter 96 times per diem. But what it is important to observe is this, that were the space in the French hospitals doubled, or made 2,000 cubic feet instead of 1,000 cubic feet, then, though the renewal of the air be half the number of times only, yet the purity of the air in either case would be the same. And the reason is not obscure, for the air of the smaller hospital is contaminated twice as much, and requires twice as much ventilation, that is renewal, to maintain the same degree of purity. Observe, again, for confirmation of this fact, that it is the same amount of air in either case which is needed for ventilation. The difference consists only in the rapidity or number of times with which air equal in amount to the contained air is transmitted through the hospitals. Now, if the hospital with the space of 1,000 cubic feet per man requires 96,000 cubic feet of new air per diem per man, or necessitates the renewal or change of the air 96 times, the hospital with space per man of 1,800 cubic feet requires only 53,333; for as 1,000 : 96,000 :: 1 : 96, and as 1,800 : 96,000 :: 1 : 53,333; and what immediately concerns the result of this investigation, as 3,000 : 96,000 :: 1 : 32. It follows, therefore, that the hospital with space of 1,000 cubic feet per man must have new air 96 times a day; that whose space is 1,800 cubic feet 53 times a day; and that whose space is 3,000 cubic feet, only 32 times a day. The first is possible only by the aid of strong mechanical means; the second would require, probably, less expenditure of force, and would not be independent of it; and the third only approaches the conditions which would probably make natural spontaneous ventilation effective to maintain the purity of the interior air. The conclusion is, that for Indian barracks and hospitals, if they must be built, and the latter, it is presumed, must be built, 1,800 cubic feet, unless in conjunction with artificial ventilation, is greatly too little; and that two alternatives offer themselves to remedy the defect—either to enlarge the space or to employ artificial ventilation.

It has been, perhaps, noticed, but may with propriety be pointedly referred to, that provided, as is probable, Dr. Sutherland's calculation proceeds on the *datum* of a space of 1,000 cubic feet per man, the conclusion he comes to agrees well with that which was stated in the foregoing part of this paper, for 1,000 × 96,000 = 96,000,000 differs but little in such a calculation from 3,000 × 30,000 = 90,000,000. Add but 2,000 cubic feet to the ventilation in the latter case, that is, make the 30,000 32,000, and the result is precisely the same. This is the more satisfactory, as the aim of both calculations was identical. This design he announced to be "to give the air of a ward the highest degree of "freshness," and in the foregoing pages it was said, "There " must be admitted into the space of 3,000 cubic feet nearly " 21 cubic feet per minute of fresh air by ventilation, if the " individual confined in it is to breathe an atmosphere " which shall contain only three times more of carbonic " acid than the air he breathes originally contained." The only sound principle in this question is the maintenance of a pure air. Data may differ. Calculations may reach the same result by different ways, but if the ultimate end be not a pure air, nothing is right, nothing thoroughly effective. And it is to be borne in mind, when the means to accomplish this end are considered, that space and ventilation bear an inverse ratio to each other, that as space increases ventilation becomes less, and that they may reciprocally bear that relation to each other, when ventilation shall become easy, or, perhaps, natural and spontaneous.

One who reflects carefully on these things, who sees the direction they point to, and would wish to realize the facts of speculations like these, would be wholly destitute of foresight, if he did not anticipate an objection, which will be immediately raised. It will be said, the increase of space you require is enormous, the expense would double that of the erection of the present hospitals and barracks. This view of the question may be admitted. Probably, indeed, the truth of it cannot be disputed. But it may be urged that this view presents but one side of the account. There is another, which it is the duty of professional men to try to exhibit. Against the expenditure in money we have to show the removal of lessened vigour and vital energy, of languor, lassitude, and discontent, of impaired health, vitiated moral tone, of disease often, and deaths not seldom, the results not obvious to sense, undeniable in reason, of the contaminated air of barracks and hospitals. But who shall estimate in money value the difference between an army moral and effective at all points, and one debased in character, and deteriorated and inefficient in physical condition? There is yet another side of this question, which appeals to the sensibilities of men. We demand for men every where, we judge imperative for those whom we would maintain in health, good and pure water, good and clean food, and we are sympathized with, and it is considered a great evil when matters are otherwise, and would be regarded a monstrous, an intolerable grievance to insist that impure and bad water, bad and impure food, should be made use of: here where matters are more patent to observation and better understood, the state of feeling corresponds at least in some degree to the necessity, and it provides against or exposes where they exist, and removes evils of

this description. But air is more necessary to man than even food and water; and pure and good air is as imperatively wanted as pure and good food, or pure and good water, nor is it in reason in any degree less unseemly that men should content themselves with, or be constrained to submit to, impurities of the one kind any more than to those of the other. If besides the injury be taken into account, it is, perhaps, just as great or greater in the instance of impurities of the air than in those of food and water. The harmony of the being and constitution of man with the physical conditions of the world which surrounds him is so perfect that nature cannot be violated by ignorance or artificial arrangements, without injury, loss, and embarrassment; and we may safely repose that confidence in that harmony which shall enable us to observe it as a rule of duty; and if, in following it out in this instance, the soldier receives the benefit of what best promotes his well-being as a man and as a moral and religious being, and amongst other things of the purest air, the result it cannot be affirmed will be inexpensive. The expenditure, however, will be the most profitable, the only suitable, well laid out in performance of a solemn duty, and in maintenance of the efficiency of that force which gives security to the common interest, upholds the throne, maintains the administration of justice in mercy, and repels, if that evil day should come, foreign invasion.

MEDICAL POLICE.

In the year 1843 I served in a committee at this station, the object of which was to report on the conditions prejudicial to health existing in cantonments, and to point out remedies. The analogy of this climate to that of the Persian coast was pointed out, the existence of fever inferred as probable, the peculiarity of this place in the limited quantity of rain was dwelt on, and the necessity of peculiar care and assiduity in sanitary matters enforced from this consideration. The reason of appointing this committee was the prevalence of sickness at the time. A year of very great sickness and mortality followed elsewhere in Sinde, and the sickness which existed here was, perhaps, on that account less observed, and little or nothing was effected for cleansing the cantonment. When first occupied, Kurrachee was esteemed and reported by Dr. Cahill, an intelligent observer, as peculiarly healthy. My own note of the place, when I first landed here, in November 1839, was, "Kurrachee has now been occupied for upwards of 12 "months, and has acquired, though I think hardly with "justice in so short a time, a reputation of peculiar "salubrity." It was occupied in the year 1838. It lost this character, as is evident from the formation of the committee before alluded to; but it was not till 1846 that it was signalized by an outbreak of cholera, sudden and terrible, which gave it a bad eminence, never to be forgotten. Out of a force of 6,626 men bearing arms, almost in equal numbers Europeans and natives, including women, children, and native followers, the deaths in different hospitals were 915 out of 1,841 attacked by the disease between June the 14th, when it made its appearance, and July the 11th, when it ceased. In four days, from 15th to 18th inclusive, there were admitted on an average 203, of whom on an average 110 died daily. Two regiments suffered in an especial manner. In Her Majesty's 86th regiment, out of 434 seized, of whom were 18 women, five children, and one native follower, 258 died, of whom 15 were women, four children, and one native follower. In the 1st European regiment Fusiliers, there were 252 admissions, of whom six were women, six children, 19 native followers, and of these died 103, being men 83, women five, children three, and native followers 12. Cholera had prevailed sporadically for about 12 months previous, but before that time also had prevailed, but never with such dread severity. Now, passing all other circumstances without notice, and some of them are not unimportant, such as the dearth and scarcity of provisions at the time, it is very desirable that it should be distinctly known, as Dr. Arnott informs us, that the state of camp and neighbourhood at that time was most obnoxious, and as much neglected as if medical police had never been heard of. In No. II. New Series of *Transactions of the Medical and Physical Society of Bombay*, page 182, published in 1853, Dr. Arnott mentions sources of disease common to all regiments then at the station, and then he says:—"But "there were others peculiar to the position of the camp of "Her Majesty's 86th regiment and the Bombay Fusileers. "They lay still further to the eastward or leeward of the "other lines, and of the suddur bazaar. Between the "latter and these camps . . . was a large piece of "bare waste ground, where all dead animals, the cleanings "of necessaries, the sweepings of streets, and where in fact "most of the filth and offal of the camp was deposited. "The accumulation of putrid animal and vegetable matters "was enormous." He states that the Fusileers had been too long encamped on the same ground, that the tents were crowded, and the ventilation little attended to, and then adds,—"Under these circumstances there was "certainly enough, if not to engender disease, at least "to encourage its propagation and extension. And "I have always viewed them as accounting for the "intensity of the attack in these two regiments." Had this fact been known to Dr. Carpenter, *Human Physiology, Ed.* IV., 1853, pp. 549–50, he would have found in it, it is presumed, a more efficient cause of this disaster than even previous fatigue and overcrowding, which, no doubt, the latter especially, were very prejudicial. His analysis of the features of the case omits this scandalous impropriety, and is somewhat inaccurate in other particulars; but his conclusion that corrupted air gave intensity to the malignant scourge is only more confirmed by the fact, judiciously recorded by Dr. Arnott. Kurrachee, in 1839, was healthy. In 1843 fever prevailed severely. A peculiarity, elsewhere observed by others in situations where corrupted air infested the locality or the antecedents which generate it, abounded, was very frequent in Kurrachee in 1843. It was experienced amongst others by myself. At meals principally, or immediately after, without much warning, uncontrollable nausea and vomiting suddenly appeared and quickly subsided, without other obvious derangement of health, previous or subsequent. In 1846 the unhealthiness of the place culminated as has been related; but frequent sickness and cholera in milder forms prevailed afterwards, especially in the years 1851 and 1852. In the former year, in April, by the foresight and energy of Sir Bartle Frere, then Commissioner in Sinde, a committee of conservancy was formed, and of this committee, in November of the same year, I became secretary. The appointment of this committee was the first step to sanitary improvements in Kurrachee. In less than one month from its formation, the resolution for the erection of furnaces was passed, at first only experimentally; but the existence of many of these erections now gives a feature peculiar to itself to Kurrachee as respects the outskirts both of the town and cantonment. In 1852 the practice of the inhumation of the waste and filth of the jail was carried out by the committee, a practice which to this day beneficially continues. The operations of the committee were limited and embarrassed by want of funds; for available resources were yet small, and all the suggestions of the committee could not be immediately embodied in the material accomplishment of their designs. It was therefore reserved to Sir John Hall, on his visit to this place as Deputy Inspector-General in the early part of the year 1853, to point out, as he did most forcibly, the unreformed nuisance which had existed since 1846 and shed its baneful influence ever since, though not with such awful virulence as marked the calamitous cholera of that year. By his report the interest of Lord F. Fitzclarence was roused, and thus a new and happy impulse was given to sanitary improvements at Kurrachee. By additional furnaces, by increased establishment of those employed in the cleaning department, and by better supervision, the most prominent evils were completely removed and a system set agoing which rendered the recurrence of them impossible. It cannot be said that all is even now as it ought to be; but there is a readiness to recognize defects,—a great contrast to former times,—which consist principally in the yet too limited establishment, and which there is reason to hope will be removed.

But little interest, it may be thought, attaches to a narrative like this. Perhaps even it may be judged by a severer censor that, through partiality and an overruling estimate of local concerns, it is sought to give undue prominence to what does not merit deliberate consideration. Let us then revert to the facts already noticed: at first Kurrachee was healthy; gradually the health of the place deteriorated, and the year 1846 makes it memorable as the theatre of one of the most calamitous epidemics recorded in the annals of medicine or of history. Nor was it till after the year 1852 that the place enjoyed an immunity from yearly attacks of fever and often of cholera. But this is exactly the era of the sanitary reforms, and the removal of obnoxious practices and nuisances is precisely simultaneous with the cessation of epidemic disease. No one can consider the history and connexion of these facts with due care and avoid the inferences that neglect of sanitary police and the presence of disease, and, on the other hand, attention to police and the cessation of disease, which they fully establish, stand in this case in the relation of cause and effect, that it is not hopeless to set limits to the most virulent diseases, and that were due precautions, such as science indicates and experience confirms, had recourse to, life would be saved, much misery averted, and climates, without changing character, would lose the terrors and the dangers which environ them, which impair the enjoyment of life, often curtail it, and add incalculably to the expense of the government of the country. It must be

admitted that this year, contrary to expectation, cholera visited the place. It advanced from the eastward, invaded several villages, appeared at the harbour, at Keeamaree, in the town and jail, and, lastly, in the cantonment. The incursion, however, was brief, the numbers attacked limited, and the deaths few absolutely, and even more so relatively to the actual amount of the developed disease. There have been then seven years of exemption from the disease with diminished sickness in other respects, and, in the eighth year, an attack which one cannot but characterize as mild, and this, though it qualifies yet cannot set aside, and scarcely, when we make allowances for other circumstances, invalidates the general result.

This result certainly merits attention as an instance of the effect of sanitary measures, and the good which ensues when they are pursued on an adequate scale; and, as before hinted, this result, confirmed by experience, is indicated also by science. The geologists in some of their sketches picture to us the naked crust of the earth, then the disintegrated mountains, next the decomposition of the fragments thus freely exposed by the agencies which operate on them. Plants spring up after this, and the mixture of organized products with the inorganic transforms the sandy soil into fertile mould, increase of vegetation goes on, and, lastly, animals appear upon the scene. Now in the earlier stages of this process, and in all that we recognize then in the inorganic constituents of the earth and air, there is found nothing noxious to the life and health of animals. Organization afterwards gives rise to new compounds and new products, and when these, as waste refuse material, are accumulated in neglected masses, in the process of reduction to simpler combinations, the result of ordinary chemical affinities when the cessation of vitality has left the organized structures an easy prey to them, gaseous compounds are formed prejudicial to health, and which are capable, some of them, of a power passively or more actively to extinguish life. Connected with this subject, in the report on Colaba, I had occasion to observe "earth, air, "and water, though viewed very differently in ancient and "modern times, are still the great elements which influence "man's condition and development, and the health he "enjoys. They are simple, harmless, beneficial in themselves. The necessities of vegetable and animal life, the "action of living properties, and the affinities of organized "products resolve them into new combinations, and some "of these are highly injurious. It is the object of science "to disclose and unveil all evils of this kind, and of "science, practically applied, to obviate and remove them, "and a generous confidence in the harmony of man's condition with his duties and enjoyments ought to make us "slow to believe that any natural evil is beyond the control "of science rightly directed or without a remedy of which "only lack of industry or of sagacity may obstruct the discovery and the application. Nor when we pass from the "more tangible objects comprised under these divisions "to the consideration of the imponderables,—heat, light, "and electricity,—is there found any fact which renders "the judgment of nature and of science which has been "announced visionary or untrue." Man received commandment to increase, multiply, and fill the earth and subdue it, and more especially in regard to that portion where his lot was cast to dress and keep it, and it is evident that his success in compliance with the former part of his obligation is dependent on his diligence in the execution of the latter part of his office. Nor is this true simply as respects subsistence, but as respects health and well-being also. He dresses the earth for food, but if he neglects to keep it, to return to it what he takes from it, the accumulated waste materials will accuse him and punish him for neglect, and the earth itself will fail to yield its increase. Thus uncultivated marshes generate ague, torment and kill men, but, drained and cultivated, they are beautiful, healthful, and produce food for man and beast. The waste of animal matters, recrementitious products of the arts, or decaying products of organization left to diffuse the noxious gases that arise from them into the air, contaminate it, and affect the health, longevity, and productiveness of man, teach him, if he will hear, how he has neglected his duty to the earth and himself, and warn him to dress the earth and keep it. Towns and camps, where medical police has failed to remove noxious matter, have often afforded proofs and illustrations of this hurtful ignorance and prejudicial neglect of duty. Kurrachee was an instance of this kind, and though at this place the condition of agriculture and the prejudices of the people in great measure rendered it impossible to return immediately to the earth for fertilizing purposes the waste products of busy industry and civilization, yet the partial compliance with the great primitive commandment carried out by the inhumation of noxious substances and their assimilation with the soil and the dissipation of their elements by incremation and their transmission through the air to feed the vegetation they should come in contact with. Even these imperfect modes of freeing the station from impurities have been attended with results most evident, efficient, and satisfactory.

The chemist takes a small piece of rock, submits it to his refined analysis, and ascertains with precision the ultimate components of it, and their respective proportions. He knows then, without further research, that he can affirm correctly what are the ingredients of the mountain from which the fragment was taken, of the chain of mountains to which the first belongs, of other chains, possibly, which stretch into other countries, or even of those, perhaps, which exist in countries divided by the ocean from that which afforded the specimen subjected to his analysis. And, however this may be, he is at least certainly in condition to declare, whenever a substance which possesses the same sensible and physical properties as that examined by him offers itself to his notice, that the components of it are identical with those of the portion of rock the constituents of which he had determined. Universally in nature the same results are yielded by homogeneous substances when chemically analysed. The same universality belongs to experiments in physical science. When Pascal found that the column of mercury varied in height, when measured at the bottom, middle, and top of the Puy de Dôme, he felt quite sure that the same result would be found on any other mountain by any other philosopher who should make the experiment. Uniformity of antecedents produces uniformity of consequences also. In medical and in sanitary matters the same principle eminently applies. How many thousands of important decisions are made daily by the application of analysis, and how fruitful is this procedure in good results. But how few comparatively are guided by the results of actual and immediate experiments. The few labour, and the many enter into their labours. Experimental philosophers and discoverers are rare, but innumerable are those who, by the knowledge of their discoveries and the use of analogy, reap the fruits of their sublime achievements, and confer untold benefits on the world. This principle, though constantly operative, is no doubt obscurely recognized; and the reason of this is. that it is often prejudiced by misapplication. Were it possible, by due discrimination, to secure identity of circumstances in the matter dealt with, compared with that to which by analogy we liken it, there would be no disappointment in results. The event would answer expectation, and the principle would be as familiar and well known as its effects would be evident and beneficial. In inquiries in science this precision is attainable, and the progress in knowledge corresponds; but in the vast multitude of the world's mixed affairs discrimination is often at fault, perfect adaptation and similitude neither can be effected nor offers itself, the conclusions we desire and anticipate come not into view, or come denuded of their splendour or mutilated in their fair proportions, and then doubt, mistrust, and suspicion attach to the principle and procedure, which ought rather to be attributed to him who has made a wrong application of them. In applied science, therefore, the obstructions are formidable, the world is incredulous, and progress is slow; yet sure it is, though slow. And just in proportion as care and discrimination are used in the application of principles in practical science, established by experiment or example, to cases in actual life, just in the degree there is attained a conformity of conditions or circumstances between these original examples or experiments and the analogous cases which present themselves, just in that same degree and proportion shall results conform to expectation, effects to principles, and then shall the application of them, by analogy, stand vindicated to all the world. Practical ability consists in the perception of these analogous conditions, and he only profits by experience who learns readily to apprehend and rightly to use them. The sanitary measures resorted to at Kurrachee may be regarded as bearing a double relation. When it is considered that examples innumerable have established the principle, just as if it had been ascertained by so many experiments, that impurities caused by waste and excrementitious vegetable and animal matter contaminate the air, which, being respired in this state, originates disease in the human frame, that the removal of these impurities where they exist, or the prevention of them, removes or prevents disease, and when by analogy use is made of this principle, and the cleanliness it demands is realized in Kurrachee, and the exemption from disease which was expected is experienced, the measures adopted here are in that case neither an original experiment nor a deduction from numerous observations, but the application of a precept or principle by analogy; there is no novelty and no uncertainty in the matter; on the contrary, the precept receives additional illustration and confirmation from the new example. Again, if we look at the measures put in use here, not in reference to the principle that guid-

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them or the end proposed, but in respect to the means by which this is effected, these, it is seen, are peculiar, and perhaps merit some separate consideration. It might almost seem, indeed, that in this view what has been done here may claim the rank of an original experiment; original only, however, it is in the means employed and in urging the necessity of the strictest sanitary police for the health of troops in camps or cantonments; and in holding up Kurrachee as an example pregnant with instruction, it is to be observed that what is demonstrated and enforced by it is cleanliness. If it be thought and said that the means used here, the burning in furnaces and the burying in trenches of the waste matter of the town and cantonment, are simple, easily worked, and admirable in their effects, and therefore worthy of imitation elsewhere, this is quite a secondary affair. What is really insisted on is an absolutely perfect system of sanitary police. The means by which it is carried out may vary indefinitely, but that method only is the best which, without damage done to any other private or public interest, combines cheapness in cost, ease in working, and efficiency in result. It is the object, then, of these remarks strongly to insist on the benefits of sanitary police at Kurrachee, to urge the adoption of similar measures in every standing camp or cantonment or town in India, and if no better means suggest themselves, to recommend the use of those which have been employed at Kurrachee.

It remains to present in brief form the conclusions established and measures recommended. Drunkenness, the parent of crime, disease and death, is an obtrusive, obnoxious habit in the army. All endeavours yet made to eradicate the evil have failed. The great step to be made in order to extirpate drunkenness, that without which other means will prove abortive, is the abolition of the canteen. Prostitution, which produces five times a greater amount of venereal disease in European regiments than what exists in native regiments, ought not in any way to be sanctioned, nor ought any regulations except those which are repressive to exist on the subject of prostitution. Marriage, on the other hand, the only effective remedy for immorality and for venereal disease amongst the troops, ought not to be restricted, but free, and the additional cost which might follow, if any follow, should be asked for from the nation, which must have troops, and would choose rather to have moral, healthy, effective troops, and would willingly pay for them. As respects accommodation, that hitherto supplied to troops has been extremely defective, nor has the nature of the structures in barracks and hospitals remedied the defect. Two alternatives exist if a remedy be sought. These are enlarged structures or ventilation. Space in buildings and ventilation bear an inverse ratio to each other, and as in India artificial ventilation does not exist, ample space is all the more requisite. This space must always be required in hospitals, but if the expense for barracks be too great, another course, not before indicated, may be adopted in lieu of barracks. Following the example of native troops, let the men marry and live in cottages. These aggregated and constituting villages, would resemble the lines of a native regiment. Perfect cleanliness in every town, station, camp, cantonment in India should be observed. Waste matter of every kind should be with the greatest care and promptitude reduced to innoxious forms, and if not applied to agriculture or other useful purposes, disposed of as at Kurrachee, by incremation or inhumation. If we suppose the troops have good water, good food, good clothing, and good medical attendance, the measures enumerated above seem to be those which make the complement of what is needed to constitute a perfect sanitary system for the army. They are not less important, though less obvious and appreciable, than those advantages which we assume the troops to enjoy. Their importance is such that no greater benefits, when we except divine grace, which no act of man can convey, can be conferred on the troops. The want of them vitiates much good. The attainment of them therefore is a double benefit. In the removal of evil, in imparting good, in the emancipation from pernicious influences, and restrictions, and in bestowing those privileges and advantages on the troops, the ravages of immorality, disease, and death will be checked, many valuable qualities will be brought into being, the soldier will rise in new splendour and dignity, become an example to the nations, and adorn the religious character of his country, to which he has too long and too often been a blot and a reproach.

It remains to make one remark. It has been said by a high authority, European soldiers cannot maintain health or vigour in the plains. Without disputing the statement, the fact, it is averred, has not been proved. The statement it may be said, rests on experience. But the experiment has never been made, nor experience gained in circumstances which command respect. If the foregoing remarks prove anything, they show that the conditions of the experiment have never yet been pure and simple, that the accessory conditions have produced disturbing effects, and vitiated the results. What is called experience, therefore, in this case is fallacious. We may not affirm that the assertion is wrong. We affirm that the conclusion is premature. This point is to be decided only when the conditions of the experiment have been purged. Then only shall we attain a conclusion, as derived from the unmixed conditions of the case, on which reliance may be placed. This remark applies to the plains generally, as also specially to many stations, pronounced unhealthy, when the experience which decided the question was both far too limited and obtained under circumstances which, as they vitiated it, should have robbed it of the confidence hastily reposed in it. Again it is repeated, purge the conditions of the experiment of all accessories that complicate and vitiate it, then begin anew, note what happens, and adopt it as conclusive, for then only are we following the rules of philosophy, then only reaping facts which as the fruit of genuine experience are entitled to confidence and respect.

I have the honour to be,
Sir,
Your most obedient servant,
D. GRIERSON, M.D.,
Surgeon Major, Staff Surgeon.

Kurrachee, 31st December 1860.

NEEMUCH.

Accommodation
- Queen's Troops
  - Artillery - - 148
  - Cavalry - - 119
  - Infantry - - 665
- Native Troops
  - Cavalry - - 316
  - Infantry - - 783

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The country within five miles of this station is flat, undulating, rocky, and dry. There is no wood or jungle in the vicinity, and no water of any considerable extent. 2. The station is elevated about 1,476 feet above the sea; but is on the same level as the adjacent country. It is from 10 to 12 feet above the nearest water. There is no higher or healthier ground adjoining the station. 3. The nearest mountains are at a distance of about 70 miles from the station. 4. There are two nullahs within camp limits, which contain running water for about nine months in the year. There are several nullahs and small rivers within five miles of the station. The vicinity is not liable to inundations. The ground is slightly broken and irregular along the banks of the nullahs, which almost encircle the station, and is doubtless a source of malaria during and after the rains. 5. The western side of the camp is well exposed to the prevailing winds, and is not encumbered with trees, &c., nor sheltered by higher ground. The eastern portion is shut out from the prevailing winds by the bazaar. The temperature of the station is not raised by exposure to reflected sun heat. For four months of the year cold north and north-east winds prevail, and for the remainder of the year west and south-west winds. The station is

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	too far inland to derive any benefit from the sea breeze. The dry north-east wind appears to predispose to hepatic affections and rheumatism. 6. The country surrounding the station is cultivated; but there are no works of irrigation near it. There is no cultivation of rice or indigo, neither is the preparation of hemp or flax carried on near it. 7. The town of Neemuch is within half a mile of the station. The population varies from 8,000 to 10,000. 8. The ground on which most of the buildings in camp stand is a red soil with a substratum of trap, and indenting and encircling the camp is a belt of black soil. The ground has not been occupied previous to the erection of the station. 9. On the lower ground water is to be obtained at a depth of 19 feet during the dry season; whereas on the higher ground the wells run dry. During the rainy season water is to be found at a depth of from three to five feet below the surface. 10. The natural drainage of the station is good, and there is no lodgment of water even after a heavy fall of rain. The subsoil being impervious, the drainage is entirely on the surface, the water finding its way to, and being carried off by the nullahs. No drainage from higher ground passes into the subsoil of the station. 11. The water supply of the station is derived from wells; but is not stored in tanks. There is a tank within a short distance of camp, containing water for about 10 months in the year; but it is not used for the purpose of supplying the station with water. It does not contain either plants or animals. The wells which contain drinking water are not liable to pollution from leaves or other impurities falling into them. No surface impurities can drain into them. No nuisance or malaria proceeds from either the tank or wells. 12. There are 39 wells in camp, which give a sufficient supply of water. The water is hard, but good, and there are no marked peculiarities in its colour, taste, or smell. The water is raised and distributed by water-carriers specially employed for that purpose. Any further supply can be obtained, when desirable, by sinking other wells. 13. There are no other topographical points on which to remark. 14. All stations are selected by a military committee composed as follows:—One officer of the quartermaster-general's department, one medical officer of superior rank, and an officer of rank and standing, together with a civil officer in charge of the district. No improvements can be suggested.
II. Climate.	1. The only instrument available at the station for conducting and registering meteorological observations, is a common thermometer. 2. Table of meteorological observations from 1st January 1860 to 31st December 1860.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, Dew, Winds, Storms, &c.
		°	°	°	°			°					
January -	—	55	18	62	49	—	—	75	0·00	N.E.	Moderate.	—	Cloudy. A light shower of rain fell on the 22nd.
February -	—	60	21	71	50	—	—	84	0·34	Variable.	Calm.	—	Cloudy on the 20th.
March -	—	70	23	80	60	—	—	97	0·00	W. & S.W.	Moderate.	—	
April -	—	81	22	92	70	—	—	97	0·00	W. & S.W.	High Winds.	—	
May -	—	84	20	94	75	—	—	94	0·31	W. & S.W.	High Winds.	—	Cloudy on the 16th.
June -	—	80	17	82	78	—	—	82	1·65	W. & S.W.	Monsoon from about the 20th, occasional storms.	—	Cloudy on the 12th, 13th, and 30th.
July -	—	74	11	76	73	—	—	—	11·79	W. & S.W.	Monsoon.	—	Cloudy and thundering from the 1st to 6th, and again from 11th to 22nd, and from 26th to 30th.
August -	—	74	9	75	73	—	—	—	15·68	W. & S.W.	Moderate.	—	Clouds and thunder from 1st to 20th.
September	—	75	12	79	71	—	—	82	3·83	W. & S.W.	Calm.	—	
October -	—	71	19	77	66	—	—	—	0·23	N.E. & W.	Calm.	—	Cloudy. Light showers of rain fell on the 3rd and 16th.
November	—	67	22	78	56	—	—	89	0·00	N.E. & W.	Moderate.	—	
December	—	65	21	76	55	—	—	87	0·33	E. & N.E.	Moderate.	—	Light showers fell on the 19th and 20th.

3. The climate varies with the season of the year. From the 15th November to the 15th February it is cold, dry, and bracing, and from the middle of February to the middle of June the heat gradually increases, the maximum being attained during the month of May, when fierce hot winds prevail. During the monsoon the climate is mild and pleasant. In October the heat again increases, decreasing at the latter end of the month. The diurnal variation of the temperature is great, the nights being generally cool and pleasant, owing to the elevation. The atmosphere contains but little moisture, even during the monsoon, and the air is free from dust and other impurities. The surrounding country is but thinly covered with trees of any size. With proper precautions the climate would not be very prejudicial to the health of the troops. The diet should embrace a liberal supply of vegetables, and beer in moderation. The barracks should be spacious, well raised from the ground, and sheltered from the sun's influence by broad verandahs. The clothing at present in use appears to be well adapted to the climate, as it is sufficiently loose and allows the free movements of the body and unimpeded circulation. The khakee clothing is admirably suited for the hot weather, as is also the serge tunic during

NEEMUCH. BOMBAY.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	the damp and variable weather of the monsoon. The wicker helmet is an insufficient protection and requires a thicker covering of cotton to protect the head from the powerful influence of the sun's rays during the hot season. A moderate amount of exercise is required for the preservation of health in India, and therefore drill, if carried out with a due regard to the season of the year, cannot but prove beneficial. In the hot months soldiers should not be exposed on parade later than half an hour after sunrise, or before sunset. Soldiers on duty should have sufficient accommodation to shelter them from the sun and weather, and sentries should always mount guard under cover. December, January, and February are the most healthy months, and May, June, October, and November the most unhealthy at this station. Fevers are the prevailing diseases at all seasons. 4. There is no district near the station with a climate more conducive to health than that of Neemuch. 5. The experience of the Committee has been extended over nearly the whole of the Bombay Presidency. It is of opinion that the stations in the South Mahratta country and the Deccan possess climates the most conducive to the health of the troops.
III. SANITARY CONDITION OF THE STATION.	1, 2, 3. Plans of the station, district, and barracks are transmitted. 4. Table of barrack accommodation :— Date of construction, 1858. Total number of rooms, 9. Total regulation number of non-commissioned officers and men, 109.

Barrack Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		ft. in.	ft. in.	ft. in.				ft. in.		ft.	ft.
1 Main Room - -	100	200 0	24 0	21 0* Mean.	100,800	1,008	48	1 9	28	5	4
4 Non-commissioned Officers' Rooms.	1	18 0	10 0	11 9	2,115	2,115	180	1 9	2	5	4
4 Ditto - - -	1	10 0	10 0	9 10½	987·5	987·5	100	1 9	2	5	4
Guard Room - -	1 Serjeant 12 Privates	35 0	17 0	9 6	5,652·5	434·8	45·77	1 9	2	4½	3
									2 Doors	6½	3½
Prison Cells - -	1 or 3	19 3	11 6	14 0	3,099·18	3,099·18 1,033·06	221·37 73·79	1 9	1 Door	6	2

* Mean, including Roof.

The solitary cells are only 8 in number, and therefore, should occasion require it, as many as 3 men may be put into one cell. Each cell has a door, 6 × 2 feet, and 2 ventilators in the roof, which is flat.

5. The windows of the main room are on opposite sides; of the small non-commissioned officers' rooms, on adjacent sides; and of the larger non-commissioned officers' rooms, on the same side. They are French windows, and open inside. There is a verandah on both sides extending the whole length of the building, the end portions forming the non-commissioned officers' rooms. The extent of the verandah is 161 ft. 6 in. by 10 ft. wide, measuring from the wall to verandah pillars. Neither the men nor anyone else are allowed to sleep in the verandah at night. There are no jalousies or jhilmils, but there are weather screens called "jhamps," which keep out both sun and rain.
6. The bedsteads consist of 2 planks supported by trestles, and the bedding is as follows :— 1 pillow, 2 pillow covers, 2 sheets, 2 camolines, and 1 carpet.
7. The tents used at this station are of the usual square form, 14 ft. square, 5½ ft. to the tops of the "kanats" or sides, and 14½ ft. high at the apex (interior dimensions), which gives a cubic content of 1,666 ft. The number of men in a cavalry or artillery tent is 8, and they have therefore 208¼ cubic feet, and 24½ superficial feet per man. In an infantry tent there are 10 men, which gives 166·6 cubic, and 19·6 superficial feet per man.
8. The barracks are ventilated by means of ventilators in the side walls, just under the wall plate. The guard rooms have flat slab stone roofs, through which are open ventilators protected by a slab on the top. The tents have doorways on opposite sides, which afford ventilation. In the barrack rooms, when all the doors and windows are kept shut, the ventilation is insufficient. The ventilators at the top allow the foul air to escape, but do not admit the fresh. No ventilation for tents is required in addition to that derived from the doorways. The air is cooled by means of tatties made of "kuskus." The kuskus is placed on a wooden frame made to fit the doorways. Water is constantly thrown on the tatty from the outside by a man kept for that purpose, and the hot wind playing through this apparatus is rendered cool and pleasant inside the room. The tatties cost 3 annas 6 pice per square foot. A tattie for a barrack doorway of the usual dimensions, 7½ × 4½ ft., costs 7 rupees 4 annas and 2 pice, or 14*s.* 6¼*d.*
9. The present infantry barracks at this station were run up in a short space of time, when cover was urgently required for the European troops after the mutiny of 1857. These, therefore, are not permanent. The plinth and foundation are of stone and lime work, but the superstructure of the main building is of sun-dried brick and mud, the verandah pillars (which are exposed to the rain) being of kiln-burnt bricks and mud. The tents are constructed of three thicknesses of canvass, with a lining of red or blue serge inside. There are no huts.
10. The floors of the barracks are filled up to the level of the plinth (an average height of 1 foot at this station), with earth well watered and rammed, upon which is placed a layer of stone flagging. There is no passage of air beneath the floor.
11. The materials used in the construction of the barracks are good, but the barracks themselves are merely semi-temporary ones. There are no huts for Europeans. The materials used in tents are also good. No improvements are suggested. The repairs are executed quickly by the executive engineer. The senior medical officer is responsible for the general sanitary state of the camp, but his suggestions can only be carried out through the military authorities. The walls and ceilings of the barracks are cleansed and limewashed once in six months.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	12. The lavatories, as shown in the sketch transmitted, are small flat-roofed buildings, one being attached to each barrack. There are two baths, one for the artillery, and the other for the infantry. The bath is built entirely of brick and lime masonry, with a single tiled roof. The depth of water therein is five feet at the deepest, and four and a half feet at the shallowest part. The water is supplied by a duct leading from a well outside the building, and is carried off by a pipe passing from the bottom of the lower end of the bath through the outer wall, and thence through an open watercourse, the ground having a natural slope towards a nullah. 13. A sketch of the barrack cook-house is attached. The means of cooking are the usual Indian fire-places, and the vessels are of copper tinned monthly. The water is supplied as usual by water carriers. The drainage is insufficient, and is about to be improved. The washing of the linen is performed in the usual manner by native washermen. 14. Sketch of the privies is transmitted. The privies are built of stone, with flat slab stone roof. The night soil and urine is carried away daily by sweepers appointed for that purpose. 15. The privies have open ventilators on opposite sides; but they are not lighted at night. The barracks are lighted by means of brass lamps, suspended from the tie-beams, which burn oil. There are also oil lights placed on small niches along the walls. 16. The drainage is quite insufficient, and of the very worst description. The drainage of the privies and urinals is only on the surface, which is not suitable for buildings of this description. Closed drains and cesspools are required. In the lavatories there are "percolating cesspools;" but the soil does not admit of free percolation. In the cook-houses there is only surface drainage. The barracks and hospital are dry. The fluid refuse of the barracks is daily carried away by sweepers, a regular staff of these men being kept up for the purpose. The water of the lavatories only is received into cesspits. These cesspits are within 16 yards of the barracks; but only in one instance is there a well near to a cesspit; and this is not at all affected by its proximity. The lavatory cesspits are within 15 yards of the men's quarters, from which the hospital stands at a distance of upwards of one mile. There are no foul ditches near the station. 17. The surface of the cantonment is kept properly cleansed. The refuse, and manure, &c., are carted away to a distance, that it may be burnt. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c., interfering with the ventilation of the station, bazaar, &c. 19. The sanitary condition of the bazaar is tolerably good; but the ventilation and drainage are imperfect. The water, supplied from four wells, is good and sufficient. The latrines are too close to the houses, and are not used at present for lack of a proper establishment to keep them clean. The people are obliged to resort to the surrounding country for the purposes of nature. The inhabitants of the bazaar pay sweepers to keep their premises clean. The superintendent of bazaars maintains a strict supervision, and punishes the inhabitants by fines or otherwise, if they do not attend to this matter. It would be advisable to have the latrines moved to a distance, to keep up a proper establishment for keeping them clean, and sufficient force of sanitary police to enforce the latrines being used. The native houses near the station are more or less dirty, as is usually the case. There are dung-heaps close to them; but they are not sufficiently near the station to produce any ill effects from malaria, &c. The barracks, at the eastern end of the camp, are exposed to the disagreeable emanations from the bazaar at certain seasons. This nuisance could be prevented by the removal of the bazaar, or by building new barracks at the western extremity of the camp. 20. The slaughter-house is well situated with regard to the station, being at a sufficient distance from the barracks, hospital, and bungalows. No nuisance is experienced therefrom. 21. There is a regulation in force against picketing horses in the bazaar. They are removed to a village at a distance of half a mile from the station. There are no particular regulations in force with regard to these picketing grounds, as they are sufficiently removed from the station to obviate any nuisance being experienced therein. The manure is removed for the purposes of cultivation by the people round about. 22. There are no stables for artillery or cavalry horses. The manure is carried away to a distance and burned. The picketing ground for the European artillery is within 100 yards of the nearest artillery barrack, and that of the native cavalry is within 15 yards of the nearest huts occupied by the men. The native hospital is within 400 yards of the picketing grounds; but the European hospital is fully half a mile distant. 23. The quarters for married non-commissioned officers and men are sufficient for the present requirements of the station. Married people do not occupy barrack-rooms with the men.
Officers' Quarters.	1. The officers at this station occupy private houses. These quarters are good, and I have no improvements to suggest in regard to them.
IV. Health of the Troops.	1. The station, surrounding district, and adjoining native population, are generally healthy. 2. Fevers prevail to a considerable extent; but the mortality is not great. 3. The healthiness of the population is to be attributed to the district, being on high table-land, without swamps or marshes, and to the absence of rank vegetation. 4. All the troops at present in this station were on field service in Central India before coming here—the greater part of them for a period of nearly two years. A portion of the infantry barracks on the right of the line is less healthy than the remaining portion. The ground is rather low, the floors are not sufficiently raised, and the prevailing winds are partly excluded by higher ground to the south-west. 5. The troops at this station are not camped out. 6 to 13. No experience in hill stations. 14. Frequent change of station on the plains is not desirable for the troops. A residence of at least three or four years at a healthy station is requisite to restore the tone of a sickly regiment. 15, 16. No experience of hill stations. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. A red ferruginous soil resting on a subsoil of slate or trap, or a dry sandy soil provided there be sufficient slope for thorough natural drainage, is best suited for military stations. 19. The best age for a soldier to proceed to India is at about 20 years, and the period of the year for him to land there, in November and December, in order to reach his station before the hot weather sets in. The troops on landing are sent to their regiments if near at hand, if at a distance they are sent to Khandalla on their first arrival, where they remain until a

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	sufficient number of them be collected to be sent off to the regiment. They then go through their usual course of drill, and take their share of duty with the remainder of the regiment. I would recommend, for preserving the health of recruits on first landing in India, moderate exercise without undue exposure to the sun, and a careful avoidance of liquor in excess, unripe fruit, &c. The diet should embrace a sufficient supply of vegetables with a moderate amount of animal food. 20. Troops should be sent direct from the home depôts to India. With due precautions a regiment's earlier years of service in the plains would not be attended with greater danger than after a more protracted residence in the country. 21. Troops are conveyed from the port to the interior in the following manners: by water when they are transported in steamers (if available) or country crafts; by land they proceed by railroad or by bullock train, when available; otherwise they proceed by ordinary marches. The regulations in force on the subject of transport are sufficient for the due preservation of the health of the troops. 22. from my experience I consider that the number of years a British soldier should serve in India ought not to exceed 12. 23. The present system of conducting medical boards, with respect to invaliding, works satisfactorily. 24. Invalids leaving India for home should embark in January or February so as to arrive at the beginning of the English summer.
Diseases.	1. There are regular inspection parades, for the discovery of incipient diseases, once a week at this station. 2. There has been scorbutic disease among the men of the 95th regiment, but as the head quarters of the regiment has left the station, there are no records to refer to by which means the proportion could be ascertained. The disease is attributable to the bad state of the health of the regiment at the time of its arrival here, and not to any peculiarity of the climate of Neemuch. 3. There are no records of the cases of hepatic disease available for Europeans, as the European regiment has lately left the station. Among the native troops hepatitis is a rare disease, only one case having occurred during the year 1860. 4. Dracunculus is not a common disease amongst the troops at this station. Amongst the native troops the admissions during the year 1860 has amounted to 1·4 per cent. 5. The proportion of venereal disease amongst the native troops is 3·3 per cent.; but the establishment of lock hospitals is a doubtful measure. 6. The troops at this station suffer from the following diseases, viz.:— *Fevers*, intermittent, remittent, and continued. *Dysentery*, acute and chronic. *Cholera*, Asiatic. *Small-pox*, and *Rheumatism*, acute and chronic. The following return shows the proportion which admissions and deaths from the above diseases bear to total admissions and deaths amongst the native troops, from January 1860 to December 1860:—

Total Admissions - - 1,194 Total Deaths - - - 5	Admissions.	Deaths.	Proportion of Admissions.	Proportion of Deaths.
Fever	626	1	52·4	20·0
Dysentery	6	—	0·5	—
Cholera	—	—	—	—
Small-pox	6	1	0·5	20·0
Rheumatism	78	—	6·5	—

There are no records on this head available for European troops.

7. Intermittent and remittent fevers are the most frequent zymotic diseases, and are most prevalent during the hot weather and rains. No unusual atmospheric conditions have been observed to precede or accompany these diseases. These diseases are not limited to any particular spot in the bazaar. The sanitary condition is pretty equal over the whole extent of the bazaar. The personal habits and conditions of the European troops are not such as to predispose to these diseases; but the natives, being more or less dirty in their habits, are more liable to them.
8. The duties and amusements of the troops at this station are conducive to their general state of health, provided that long exposure to the sun be avoided. They are consequently not such as to predispose to these diseases.
9. The medical officer of Her Majesty's 95th regiment has tried small doses of quinine as a prophylactic against malarious disease with advantage.
10. The removal of the troops to the high and open ground to the left of the present line is to be recommended. A more ample provision for the occupation and amusement of the men would also be advisable.

V. INTEMPERANCE.

1. The soldiers at this station are on an average temperate. There are very few confirmed drunkards amongst them, and no records exist from which the proportion of these could be obtained.
2. Drunkenness is always punished as an offence.
3. Distilled spirits are sold at the canteen, but are not permitted in the bazaar. The spirit, which is arrack, is of good quality. Each man is allowed one dram per diem. Spirit does not form part of the ration, either at the station, on the march, or in the field. The men are not allowed to get a dram from the canteen before parade. Spirit is never given as a ration to convalescents. No drinks, other than intoxicating drinks, injurious to health, are sold at the canteen or in the bazaar.
4. The consumption of spirits is injurious to the health of the troops, and is not conducive to the efficiency and internal discipline of the corps.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	5. Spirituous liquors are not supplied as part of the ration, but each man is allowed to purchase one dram from the canteen. The abolition of the sale in the canteen might prove injurious to habitual dram-drinkers, but it would be advisable to induce all the men, if possible, to take some substitute for the spirit, either beer or porter. 6. Both wines and malt liquors would prove beneficial to health as compared with spirits, but preference is given to malt liquors. 7. Coffee, tea, lemonade, soda water, and similar drinks are used at this station. Their influence on the health is beneficial, but a certain amount of stimulant is required in a tropical climate. 8, 9. It would be beneficial to prohibit the sale of spirits in the canteen, and permit only beer, coffee, tea, lemonade, &c., to be sold to the troops. 10. A reading room with a coffee shop attached is to be recommended; the coffee shop to be distinct from the canteen. 11. The bazaar regulations are such as are laid down in Jameson's Code, which apply equally to all stations. They are effectually carried out. European soldiers cannot purchase liquor in the bazaar on any consideration; natives may do so, provided it be drunk on the spot, but he may not remove it from the bazaar.
VI. Diet.	1. The ration for all European troops in the Presidency is as follows:—1 lb. of beef or mutton, 1 lb. bread, 1 lb. mixed vegetables, 4 oz. rice, 1 oz. of salt, 2½ oz. sugar, ⅝ oz. of black and green tea mixed, in proportions of ⅔ to ⅓ respectively, and 3 lbs. of firewood. The rations are inspected daily by the officer on duty, and the quarter-master, and sometimes by the commanding officer and surgeon. 2. The ration is in general complete, but fruit is not included in it. The vegetables are not always in due proportion. The stoppage is 3 annas and 4 pies (5*d.*) daily. The soldier has three meals per diem. Breakfast at 8 a.m. of bread and tea; dinner at 1 p.m. of meat, vegetables, and rice, made into various messes and stews; and supper at 4.30 or 4 p.m. (according to the season) consisting of bread and tea. The proportion of vegetables in this ration is 1 lb. for about seven months in the year, and ½ lb. for the remaining five months, which include the hot season. 3. A liberal supply of potatoes at all seasons would be conducive to health, as many of the country vegetables at present supplied are not relished by the men. At present only ½ lb. potatoes is supplied from about November until June. The rations are under the supervision of a non-commissioned officer, who superintends the cooks. There is no opportunity for the men to dispose of their rations. 4. Cooking houses, with the usual Indian fire places, are provided at this station, and are furnished with copper vessels, tinned monthly, large boilers, frying pans, dishes for baking, and tea kettles. The kitchens are clean, light, and well ventilated, and sufficiently supplied with water. The food is boiled, stewed, and baked; the cooking is properly done, and sufficiently varied. The tea is prepared in the large boiler as at home, and is not first rate. The men do not have tea, coffee, or other refreshment before a march. 5. Gardens for the cultivation of vegetables by soldiers could be advantageously established near this station, under regulations to be decided by a local committee.
VII. Dress, Accoutrements, and Duties.	1. In addition to the usual clothing worn in England, the troops at this station have for the warm weather a suit of "khakee," and serge for the monsoon. Wicker helmets, with covers, and "pugrees," are worn at all seasons. In the hot weather a waist belt and small pouch are worn, and in the cold weather an additional pouch and shoulder belt, with 20 rounds of ammunition at all times. The clothing as issued at present to the troops is suitable for the different seasons in all respects, with the exception of the head dress, which does not afford sufficient protection from the sun. A lighter and stronger description of helmet of felt instead of wicker might be substituted with advantage. The upper leather of the boots should be properly blocked, so as to fit the feet more naturally. The men on guard wear "khakee" clothing during the day, and cloth clothing from sunset to sunrise, according to the season of the year. The sentries are generally planted under cover.
Duties.	1. It would be advisable to drill the men at home and not in India, as here they have but an hour's drill in the morning and evening. 2. The men drill for an hour morning and evening four days in the week, weather permitting. They are on guard one day in seven, excepting during the period of musketry instruction. The musketry drill necessitates the men being kept out during the day exposed to the sun. The time occupied in firing 90 rounds is too great, and the number might in India be reduced to 60 rounds with advantage, as the climate does not permit of an equal amount of drill or an equal number of days as at home. From ordinary drills the men do not suffer in health. The best time for drills and parades in the hot weather is early in the morning; and we do not recommend drill in the evening at all at that season. Troops on the march should arrive at their camping ground by sunrise. The men at this station have on an average six nights in bed during the week. 3. The furthest guard is mounted at a distance of one mile from the barracks. The guards last 24 hours. There are roll calls at meals and at tattoo beatings, and on the days when there are no parades there are roll calls morning and evening. There is no doubt that night duties are trying to the men, but they are necessary to be performed. No additional precaution for preserving the health of the troops can be suggested.
VIII. Instruction and Recreation.	1. The following are the means of recreation and instruction at this station,—skittle grounds, schools with good schoolmasters, a library and reading-room, the former well lighted at night, a day-room and soldiers' gardens under the management of the men. There are neither workshops, ball courts, theatre, or gymnasia, but the first will be shortly erected. These means are sufficient to keep the men occupied in the wet season and during the heat of the day, but a theatre and gymnasia would be a great addition, and conduce much to the pleasure and health of the men. During the hot months the men are not allowed to leave the barracks, except for necessary purposes, from 8 a.m. to 4 p.m. The result is beneficial to health. 2. Suitable buildings should be erected for workshops, theatre, and gymnasium. Should the regiment here at present be raised to its full strength, an additional building would be required as a library. 3. Soldiers' savings' banks are in existence here, and are found to be most advantageous. 4. There is no shade from trees, sheds, or verandahs, &c., to enable the men to take exercise during the day, without injury to health.

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References to Subjects and Queries.	Replies.
IX. MILITARY PRISONS.	1. The cells at this station are objectionable in every respect. They are old gun-sheds inside the fortified square; and from their situation, immediately in contact with the outer wall, it is impossible to keep them cool or well ventilated. It is most desirable that large well-ventilated cells should be erected in a healthy situation, as a protracted residence in the present cells cannot but prove prejudicial to the health of the prisoners.
X. FIELD SERVICE.	1. There are no special local regulations for field medical service, not included in the general presidency regulations. 2. The medical officer can make any suggestions as regards the conduct of a line of march, bivouacking, camping, billeting, &c., and they are generally attended to. 3. Camping grounds are selected by the quartermaster-general's department; the main object being a supply of good water and high open ground. Should there be any objections in a sanitary point of view, the medical officer can make suggestions, which are invariably attended to whenever it is possible to do so. The regulations now in force appear to have worked satisfactorily throughout the Central Indian campaign, and no improvements can be suggested. 4. No reply to this query.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.
XII. HOSPITALS.	1. Plan of the hospital is transmitted. 2. The hospital is 1,100 yards distant from the nearest barrack, 850 yards from the nearest stable, and 450 yards from the bazaar. The hospital has an open site, and stands on high ground, which slopes away from it on all sides. There are no buildings, &c. which interfere with the ventilation. The site is generally healthy with reference to elevation, drainage, absence of malaria, &c. 3. The water supply is sufficient and wholesome. 4. The refuse water and other impurities are collected in cesspools and carried away at night. The night soil is removed in the usual way by sweepers. 5. The average height of the plinth is 3 feet above the ground. The floors are solid, and there is no perflation of air underneath; in fact, a passage of air beneath floors (in other stations) has been found not to succeed. The roof water is carried off by small channels projecting over the walls of the building. It does not sink into the subsoil, but is carried off by the natural slope of the ground. No guttering is required round the hospital for the rain-fall, as it runs off rapidly. The hospital is built principally of stone and lime masonry, the pillars and partition walls of brick. The walls and roofs are single, but the former are of a good thickness and keeps the hospital tolerably cool. There are no verandahs. The hospital consists of two flats. It was originally built as a residency, and has only been used as a hospital since the year 1857. The rooms are of various dimensions. Those on the upper story are seldom required for use as wards, as there is more than sufficient accommodation for the ordinary number of sick in the lower story. In the following table the dimensions of one room (the largest on the ground floor) are given, as that is always used.

TABLE of Accommodation.
Date of construction, 1821.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Heigth.	Breadth.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
		Ft.	Ft.	Ft. In.				Ft. In.			
No. 1	30, or if occasion require it 35	79	27½	25 10	56,115·67	1,870·52 1,603·3	72·4 62	1 9	11 Doors*	9½	5

* There are no windows on the lower story. The doors are double, the outer ones being Venetians, the inner glazed from top to bottom.

The hospital is so placed as to receive the full benefit of prevailing winds. The windows are French, and open inwards; they are of ample dimensions, and cannot be improved in any way.

6. None of the lower wards, with one exception, have any ventilation except by the doors and windows. The smaller of the two large rooms has 8 ventilators at the top of the room. The upper wards have ventilators in the slab stone roof. There are Venetian shutters, painted green, attached to all the doors and windows.
7. The wards are cooled during the hot months, when the hot winds prevail, by "tatties" made of "kuskus," the same being constantly watered by men employed for that purpose.
8. There are no means for warming the wards. The walls and ceilings of the wards are cleansed and limewashed once every 3 months, or as often as is required.
9. There is a privy and urinal to the N.N.E. of the hospital. Its construction is much the same as that of the barracks. It is properly drained into a cesspool, which is emptied out daily by the sweepers. The cesspool is at a little distance from the privy, and is not offensive.
10. There are two wash-houses for the hospital close to the building. They are similar to the barrack wash-houses, and are sufficient for the sick.
11. There are no bath rooms, but there are ten flat baths, which are used when required, and are sufficient.
12. The native dhobies do the washing of the hospital linen in the usual manner.
13. The storage is sufficient, and dry.
14. The bedsteads in use are the common country wooden bedsteads, laced with tape, and the bedding a mattress and pillow stuffed with straw, two sheets, a blanket, and a coverlid. Iron bedsteads should be substituted as cleaner, and less likely to be infested with vermin.
15. There is one kitchen on the north side of the hospital, and another larger one on the opposite side. They are both too close to the building, and are not large enough. There is no

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	apparatus beside the usual Indian fire-places, and copper pots tinned. The cooking is properly done, and sufficiently varied. 16. The diet tables, rolls, &c., are in strict accordance with the medical regulations of the Presidency. 17. Ten ward coolies are allowed to a regiment for attendance on the sick. They are generally very attentive, and make good nurses. Besides these, every severe case is allowed a comrade to wait upon him. Such attendance is considered sufficient. 18. The sanitary condition of the hospital and the present accommodation are as good as can be expected in a private house; but should any great increase of sickness take place, the accommodation would not be sufficient. 19. Suitable buildings for cells, for insane patients, and for hot and shower baths, are required. It is also recommended that proper quarters for warrant medical officers and for the 2nd class hospital servants be erected. The room occupied as a female hospital is too small, and not sufficiently ventilated, being low in the roof and otherwise unsuitable. 20. There are sick carts drawn by bullocks and elephants, which carry about the convalescents. There is no provision for shaded walks, &c. 21. A small detached house to the south of the building is used as a hospital for the women and children, but only a temporary measure. No improvements can be made. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations. 23. With regard to change of diet and medical comforts, the medical officer has power to order whatever may be requisite under the supervision of the Deputy Inspector-General of Hospitals. The repairs to buildings are carried out by the Public Works Department. The sanitary arrangements are partly under the supervision of the medical officer and partly under the Conservancy Department. 24. There are no wards or hospital for convalescents. Such accommodation would, of course, be advantageous, but it would be attended with enormous expense.
XIII. Burial of the Dead.	1. The burial ground used for British troops is fully quarter of a mile from the nearest building. It is to leeward of the station, with reference to the prevailing wind. 2. Its area is 9,157 square yards. Its soil is the black cotton soil, and the subsoil trap rock. Surface drainage. The ground has a good slope towards the nullah. Decomposition takes place very rapidly, and the ground is carefully kept. 3. The space allowed for each grave is 7 ft. × 3 ft. wide, with an interval of 3 ft. between each. They are dug 6 ft. deep, and are never re-opened, only one body being interred in each grave. Interment takes place about 12 hours after death. There is no burial ground set apart for Native troops; they are buried in the same place as other natives. 4. The grave-yard is never offensive. The British troops are buried in the usual manner with military honours. 5. The Mussulmans dead are buried in a burial ground at a distance of 900 yards in rear of the bazaar. The Hindoo dead are burned at about the same distance. 6, 7. No injury accrues to the public health from the present practice, nor are any improvements suggested in the modes of disposal of the dead.

(Signed) Charles Lucas, Brigadier,
Commanding at Neemuch.
E. Mahaffy,
Staff Surgeon.
E. P. Gambier, Lieutenant,
Assistant Ex. Engineer, N. & N.

1st November 1860.

AHMEDNUGGUR.

Accommodation

Queen's Troops or European Troops of the Indian Army.	Artillery	337
	Cavalry	122
	Infantry	451
Native Troops	Artillery	135
	Infantry	747

References to Subjects and Queries.	Replies.
I. Topography.—	1. The station of Ahmednuggur, distant about a mile from the town, is situated near the head of the Seena valley, about six miles from the source, and is surrounded on three sides by hills, having slight elevation above the plain, on which the station is built. The features of the ground hence admit of the water draining off freely, and little opportunity is offered for its being retained in pools and swamps. There is no wood or jungle, and little water, beyond that contained in a few pools in the bed of the Seena river, to be found in the vicinity of the station. 2. The station is about 1,900 feet above the sea level, and, being at the head of the valley, and partially surrounded by hills, it has in different places a greater or less elevation above the adjacent country. The nearest water is 52 feet distant. The station occupies the highest ground available in the neighbourhood for a cantonment.

AHMEDNUGGUR, BOMBAY.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	3. At a distance of six miles from camp is an isolated hill, on which a capacious building was constructed about 400 years ago. This place having been found to be well adapted for a sanitarium, has been occupied recently for that purpose. Its elevation above the station is 617 feet. 4. The only water in the vicinity of the station is in the bed of the Seena river, three miles from camp. The bed is usually dry for eight months in the year, and the water only appears at the surface at a few spots where pools have been formed. There is also a large nullah, a tributary to the above, which passes through camp, at some distance from the public buildings, but the quantity of water retained in the bed is very small. In heavy floods during the rainy season the water is liable to overflow the banks of both streams, but quickly subsides, and has no tendency to settle or soak into the adjacent land. There are no large pits or excavations in which the water accumulates. It is readily drained off by the natural watercourses. 5. The station, generally speaking, has an open aspect, and is well exposed to the prevailing winds. There is garden ground within the cantonment, but care is taken to prevent excessive vegetation, and hedges and trees are constantly cut and kept in order. The close proximity of the suburb or native town of Bhingar is liable to have a prejudicial effect on the health of the troops. The place contains about 3,000 inhabitants, and is kept generally in a dirty state. The streets and lanes are narrow, and badly ventilated, and the sanitary arrangements generally defective. It is desirable to extend to it the regulations in force in the cantonment, or to institute the same measures which have effected such great improvement in the state of the town of Ahmednuggur. The buildings of the station occupy a commanding position, and are not in the slightest degree liable to be affected by reflected sun-heat. The station is singularly exempt from variable winds, which have a prejudicial effect on health. It is freely exposed to the sea breeze, which diminishes the temperature, and renders the place more congenial for Europeans. 6. Generally speaking, the surrounding country is uncultivated. Towards the bank of the Seena crops are grown, but at a distance from camp. Works of irrigation are restricted to a few patches of land, watered by the surplus water from the aqueduct which supplies the camp, and by wells sunk along the river bank. It is, however, little adopted. No injurious effect has ever been known to arise from irrigation. Its extent is too limited to allow of an opinion being formed on the subject. The cultivation of rice is not prohibited, but there is not, I believe, a rice field within ten miles of Nuggur, and very few fields in the Talooka. No indigo is grown, to my knowledge, in the Nuggur Talooka, neither are hemp nor flax grown within many miles of the cantonment. A solitary and detached plot of ground may be cultivated occasionally with either of these crops, but the quantity grown is so small as not to affect health in the slightest degree. 7. The town of Ahmednuggur, containing a population of 36,000, is situated on the outskirts of camp. The suburb of Bhingar, occupied by 3,000 people, is built in continuation of the cantonment on the north-east side, and in immediate proximity to the European lines. 8. The geological structure of the district around the station comprises a trap formation, which is extensively met with in the long spurs jutting out in an easterly direction from the western range of the Ghauts. This rock is covered by a layer of black soil, which increases in thickness as the hills gradually submerge into the vallies, at the lowest points of which, and towards the banks of the principal watercourses, its depth becomes considerable, and in numerous localities the understratum of trap is found to have given place to a layer of limestone (commonly termed kunkur), which is largely employed to produce mortar for building purposes. The site on which the station stands was not in former days occupied for the purposes of habitation. 9. During the dry season water stands at a level of 18 feet below the surface. During the wet season it is only 8 feet below the surface. 10. The porous nature of the subsoil, where it consists of trap rock, which in great measure is of a soft and friable nature, affords ample means for complete under drainage of the country. The black soil, being a retentive stratum, the water which falls thereon lies on the surface till it evaporates, but the nature of the ground in the vicinity of camp does not admit of such taking place to any great extent. The rapid fall of the high ground adjacent to the station, and the defined character of the natural watercourses, preclude, in great measure, the accumulation of moisture in the subsoil of the station, beyond what is advantageous to an efficient supply of water in the wells. 11. Water is obtained from aqueducts, which have their source in large wells or reservoirs near the foot of the hills, the supply of which is further increased by percolation through the stratum, along which the excavation for the galleries or channels extend. There are numerous aqueducts and branches for the use of the town, but only one in use leads to the European lines. There is no storage of water in open tanks. The wells at the source are in many instances covered in with masonry domes. The head reservoir contains always a sufficient supply of water. These reservoirs contain no animals nor plants, and they are never used for bathing. There can be no impurities from foul drainage, &c., and no malaria can arise from any tank. 12. There are four distinct aqueducts, with numerous branches which supply the town and station. It would be difficult to arrive at an estimate of the total amount of the supply. The quality is good and wholesome, and the amount sufficient. No means of ascertaining the chemical composition. The water is discharged into distribution wells and reservoirs, and raised thence by Bheesties, who distribute the water for watering cattle and horses. Troughs are built in convenient localities in which water is maintained at a constant level. The system of supply by aqueducts has been in use for many years, and generally with satisfactory results.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	There are faults in the details of the system which demand attention, and regarding which references have often been made, but, as a whole, the arrangement is good, and adequate for the requirements of the station.
	14. The authorities appointed to determine upon and select sites for stations usually comprise members of the medical, quartermaster-general, and engineer departments, together with officers of any other service who may be considered to have a local knowledge of the subject. The system scarcely admits of improvement.
II. Climate.	The meteorological instruments at this station consist of barometer, thermometers, and rain gauge, kept at the artillery hospital, Ahmednuggur.

Observations for 1859.

Months and Years.	Barometer, Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry.	Mean Wet.	Mean Sun Temperature at 4 P.M.	Rain, inches.	Winds.		Days of Sunshine.	Remarks on Clouds, Dew, Wind, &c.
										Direction.	Force.		
	In.	°	°	°	°	°	°	°	°				
January-	27·882	71·4	22·3	82·0	59·7	71·4	60·7	115·1	0·04	S. & S.E.	Moderate in general	30	Seasonable, cloudy on 3rd, little rain and lightning.
February	27·879	76·7	23·1	87·8	64·7	76·7	62·6	116·8	—	S., S.E., W., N.W.	Moderate	27	Warm for season. At times cloudy.
March -	27·781	80·0	23·5	91·9	68·4	80·0	64·8	115·4	0·34	N.N.E., N.W., S., S.W.	Moderate and strong	28	Temperate, cloudy, rain 2 days.
April -	27·781	85·5	20·0	95·1	75·1	85·5	69·5	115·5	0·44	S. & S.E., N. & N.E.	Strong winds.	25	Close and sultry, stormy on 27th, with rain.
May -	27·745	87·4	23·8	99·8	76·0	87·4	72·4	119·6	1·05	N.W. & W.	Strong	23	Close and sultry, storm on 28th, with rain, lightning, and thunder.
June -	27·632	80·4	13·2	87·7	74·5	80·4	73·2	95·0	6·71	W. & S.W.	Do.	9	Cloudy, with heavy rain.
July -	27·600	79·1	10·1	84·3	74·2	79·1	73·5	91·2	3·74	S. & S.W.	Do.	9	Close and sultry, cloudy, high winds, with rain.
August -	27·675	76·3	10·6	82·0	71·4	76·3	70·2	88·0	7·83	W. & S.W.	Strong winds.	6	Cloudy, heavy rain and showers.
September	27·738	75·7	10·1	80·9	70·8	75·7	70·7	89·4	7·69	S.W. & S.	Strong	4	Cool, cloudy, heavy rain.
October -	27·820	77·3	17·9	86·0	68·1	77·3	68·4	111·4	1·38	N. & N.E. to S.E.	Moderate	27	Nights cold; days warm; rain on one day.
November	27·858	77·4	19·2	85·3	66·1	77·4	64·8	109·6	0·50	E., N.E. & S.E.	Do.	25	Cool and pleasant, 3 days cloudy and close, with rain.
December	27·877	70·2	21·9	80·9	59·0	70·2	60·1	106·1	0·17	N.E., & N. to E., & S.E.	Do.	28	Nights cold, weather cool, some rain on one day.

3. The climate of Ahmednuggur is healthy and dry like that of the Deccan generally, which is attributable to the elevation, 1,900 feet above the sea level. Except in the immediate neighbourhood of the cantonments, there are few trees. No canal, and but little irrigation. Occasional dust storms during the hot months, March, April, and early part of May. During the monsoon and cold months warm woollen clothing is necessary for the troops, lighter clothing during the hot months, March, April, and May. Morning and evening are the best hours for drills, parades, and exercises. The most unhealthy period is the hot months and immediately after the rains. In the former fevers and affections of the head and liver prevail. It is also the time when cholera and small pox have in general appeared. After the rains diarrhœa and dysentery are most prevalent.
4. There is no district near the station, that I am aware of, more conducive to health than the station itself.
5. I have served at Bombay, Cutch, Kurrachee, Poona, Deesa, Rajcote, and Ahmednuggur.

I regard the climate of Bombay as the worst for Europeans I have seen. I have known the health and efficiency of more than one regiment suffer to a very great extent from it. I may instance Her Majesty's 17th Foot and Her Majesty's 57th regiment, which contracted fever there, and from which the latter still suffers. The climate of Cutch is not considered good for Europeans. The 2d European Bombay light infantry suffered so severely there some years since that they had to be removed in a lamentable state. There was no European regiment there when I was there, but the European officers of native regiments, as well as the regiments themselves quartered at Bhooj, enjoyed good health. The climate of Kurrachee, now that good barracks have been built, is, I imagine, as good as any on the Bombay side of India. Kurrachee is subject to epidemics, such as cholera, dreadfully severe; but at the time of cholera, there were a great many more troops than there was proper accommodation for, as the barracks were low and small. They have been since replaced by the finest and best constructed barracks I have seen in India.

Near Kurrachee is the sanitarium of Gizree on the seaside, the pure air of which and the sea bathing are of great use to weakly men.

The climate of Deesa is exceedingly hot during some months, with hot winds like the blast of a furnace. They are not unhealthy, if Europeans avoid exposure to them. The outdoor heat is so great that healthy men have been struck down dead as if shot. The cold months are very pleasant, being bracing, with occasional frost. Within 50 miles there is a beautiful and salubrious station, Mount Aboo, now a regular sanitarium, but the climate is exceedingly damp and the rains very heavy. During the rainy months Mount Aboo is, on account of damp, unfit for many diseases, especially these of the chest and bowels. Fevers also are prevalent at that period. At other seasons the climate is delightful, almost European, sharp hoar frost and clear bright weather having a most exhilarating effect on the system. A somewhat lengthened experience leads me to consider the climate of Deesa, although hot, decidedly good, and one suitable to Europeans with certain precautions.

AHMEDNUGGUR. BOMBAY.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	The climate of Poona and Ahmednuggur are very similar, except that the latter is further from the sea, and has little sea breeze. The climate is very good, the hot months few, with cool nights, and during the rains, delightful, somewhat like that of Italy. Cold weather agreeable. During hot months, March, April, and first part of May, a hot dry wind prevails, particularly felt by those liable to liver derangement, and interfering with the action of the skin. Refreshing showers fall at the end of May, and the monsoon begins in June. October is sometimes a hot and disagreeable month. At Rajcote European officers and their families enjoyed good health. The seaside is within easy reach from it. The great want on this side of India are good sanitaria along the coast. There are no fine hills like those in the other presidencies on which to locate troops, but there are places on our coasts where sanitaria could be built, and which for certain diseases would be preferable to hill stations, such as Porebunder, Dhin, and other places on the Kattiwai coast. Dapoolie and Naree, in the neighbourhood of Vingola, on the southern coast might be named, from which one or more sites for sanitaria might be selected, the use of which might obviate the necessity for sending a great many men to England, while the quickness and facility with which men might be sent to them, would save many valuable lives, besides economizing public money.
III. SANITARY CONDITION OF STATION.	1, 2, 3. (Maps and plans.)

4. The following are the details of barrack accommodation at the station.

Date of Construction.	Permanent Barracks 1831.	Temporary Barracks 1859.
Total number of rooms or huts.	Ditto 12.	Ditto 12.
Total regulation number of non-commissioned officers and men	Ditto 600.	Ditto 600.

Barrack Rooms or Huts.	Regulation Number of Men per Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
Permanent Barracks :		Feet.	Feet.	Feet.	Feet.			Feet.			
Artillery 12 -	50	107·5	24	22	56,760	1135·2	51·60	1·5	22	4	3
Temporary Barracks :											
Infantry 12 -	50	131	22	14	40,348	806·96	57·64	1·5	12	4	3
Guard-rooms :											
Artillery - -	9	24	18	14	6,048	672	48	1·5	2	5	3·5
Infantry - -	8	22	22	14	6,776	844·5	60·5	1·5	2	4	3
Eight Prison Cells -	1	10	10	15·5	1,550	1,550	100	1·5	Ventilating apertures instead of windows.	—	—

5. The majority of the buildings are provided with windows on opposite sides of the rooms. The windows are usually fixed in folding frames opening from the inside. Verandahs are invariably provided, in some instances enclosed at the extreme ends to form quarters for non-commissioned officers and other similar purposes. The average width is 10 to 13 feet.
   In the broader verandahs the space is enclosed to add to the interior capacity of the buildings, and to furnish an additional apartment for the men to take their meals in.
6. The beds consist of iron trestles with boards. The bedding supplied by Government, good and sufficient, no improvements to suggest.
7. The tent accommodation is as follows :—European double poled for 22 men consists of fly, shell and six feet walls of three thicknesses of cloth. Interior dimensions 22 feet by 15 feet. Cubical contents 2,826 feet. Superficial area per man, $15\frac{2}{3}$ feet. European, single pole for 13 men, as above, 14 feet square, cubic contents 1,601 feet. Superficial area per man 15 feet. European hospital tent for 20 men consists of fly shell and double walls, six feet and five feet, forming a verandah. Interior dimensions 24 feet by 14 feet, cubic contents 2,821 feet, superficial area per man $16\frac{4}{5}$ feet. Tent, native double poled, for 30 men consists of single fly of two thicknesses of cotton cloth. Interior dimensions 22 feet by 14 feet. Cubic contents 903 feet. Superficial area per man $8\frac{6}{15}$ feet.
8. Ventilation in permanent barracks is effected by giving the rooms a sufficient height, with clerestory windows in the height of the walls. There are metal and wooden ventilators in the ridges of the more temporary buildings. Where the walls are low, ridge ventilation is generally employed.
   The arrangements suffice to ventilate the buildings equally well by night and day.
   No artificial means of cooling the air are required in this climate.
9. The permanent barracks are built of brick. The temporary barracks of wood framing and wattle and dab walls.
10. Floors generally are made of moorum well beaten down and consolidated with water. Their surface is raised from one to two feet above the level of the ground, but there is no arrangement for a current of air passing under the buildings.
11. The materials used for building are generally well adapted to the climate, but in temporary buildings it would be desirable to substitute kutcha brick for wattle and dab.
    Repairs are executed by the executive engineer and (by recent arrangements) partly by the barrack master, immediately on representations being made by the officers in charge of the buildings.
    The brigadier, or chief military authority here, is responsible for the sanitary state of the station.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	Barrack walls are whitewashed at intervals usually of six months, but oftener if the medical officer considers the work essential. 12. There is a separate lavatory to each barrack, and the water after flowing off the washing bench is made to pass through a urinal, which it cleans in its passage, and thence into a cesspool. 13. The cooking apparatus is simply a raised masonry bench with projections on which the cooking utensils are supported. The water is supplied by bheesties, and the refuse liquid is collected in cesspools which are cleansed daily. No linen is washed at the barracks; it is taken away by washermen and brought back when ready. 14. The privies are built in the immediate vicinity of the barrack buildings. Their contents are removed daily by sweepers, and the refuse liquid of privies and urinals is collected in cesspots and removed daily. 15. The ventilation of the privy buildings is given by a large cubic space and numerous openings. 16. There is no drainage by sewers. Night soil is daily removed from the cesspits of privies and urinals. The ground in the vicinity of the barracks slopes sufficiently to admit of all surface and other drainage being readily carried off. No part of the buildings is damp. All the fluid refuse, as already stated, is collected in cesspits and removed daily. These cesspits are three feet by three. They are at the end of each barrack, built at the surface of the ground, distant from the wells, which cannot be injured by them. The spot of ground adjacent to the station behind Bhingor is made very offensive by the native population of the latter using it as a receptacle for dirt and refuse. 17. Surface cleansing is done daily by the conservancy carts, and is as efficiently done as the limited establishment will admit. An increase is required and strongly recommended. Refuse and manure are removed to a considerable distance; that from stables, &c., is disposed of and carried away by purchasers. 18. The cantonment is kept free of vegetation, except the officers' compounds. There are no old walls, hedges, &c., interfering with the general ventilation. 19. With regard to the bazaar the surface drainage is good, and water is rapidly carried off. The water supply is abundant, and cleanliness strictly enforced. There are no latrines. No crowding permitted. Two carts and two pairs of bullocks carry away the refuse daily. Every one is obliged to collect it in a basket, and throw it into the cart as it passes the house, and constant supervision of the premises, with fine, if found offensive and dirty. The system works well and the bazaar is clean. No improvements suggest themselves. The inhabitants of Ahmednuggur and Bhingar are permitted to answer the calls of nature on the very boundary of camp. The effluvia from this cause, while objectionable, is unavoidable. When the wind blows from the north, over the native dwellings to the cantonment, the smell of ordure is very perceptible. This arises from the fact that the residents of places not under military control are allowed to have their privies near their houses, and the removal of the filth not being duly attended to, the atmosphere must become tainted. This as regards Bhinghar is repeatedly felt. The remedy is simply that the places, if permitted to remain, be daily cleansed. 20. Animals are slaughtered on the limits of camp. No regulation relative to slaughter places, save as regards time and cleanliness. Cattle are killed morning and evening. Birds of prey and dogs devour the offal. No nuisance experienced from slaughtering places. 21. The bazaar horses, where there are no stables, are picketed on a piece of ground behind the bazaar. The place is swept every morning, and the dung either removed or made into fuel. 22. There are no stables belonging to the station. Artillery and cavalry horses are picketed in an open space in front of the artillery barracks, at a distance of 200 yards. Dung is removed daily, and disposed of to brick manufacturers as fuel. 23. There are 80 separate permanent quarters for married artillery soldiers; enough for the barracks. There are none for the infantry in the temporary barracks, and it is not yet decided if any will be required. *Officers' Quarters.*—1. Officers live in bungalows, the property of private individuals. They are advantageously arranged as regards position and other sanitary respects.
IV. Health of the Troops.	1. The station of Ahmednuggur, the district, and the native population are healthy. 2. The disease most prevalent among the native population at certain seasons is fever of the intermittent type. They have had occasional invasions of epidemic cholera and small-pox; the latter is, however, becoming more rare as the benefits of vaccination are becoming better known and more permitted among the native population, who here, as elsewhere in India, have been exceedingly averse to it. Affections of the spleen are not common. 3. I consider the absence of jungle and rank vegetation as the great cause of healthiness in the surrounding district; also that there are no swamps or other sources of malaria. 4. The artillery who form my medical charge are principally recruits fresh from England. No. 18, light field battery, arrived here from active service in Central India on the 16th of September 1859; generally speaking the men were in good health on arrival, and have continued so since; some have had rheumatism and some fever, but not to any great extent. Three of the barrack rooms are not so good as the others, on account of some mistake in the estimates for improvements.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	5. The troops are not, as a general rule, camped out. A portion of Her Majesty's 57th Regiment have been lately camped out for rifle practice in the cold season; their health was very good. 6. I have not been in charge of troops at hill stations. 7. So far as my limited experience goes, I cannot say that troops who have been at hill stations have suffered more on returning to the plains than their comrades who had not gone. 8. My experience of hill stations has been very limited, but under certain conditions I should think that hill stations would be beneficial to the health of European troops. 9, 10. No experience. 11, 12. The best months for residence at hill stations would be March, April, May, and October, the hot months. There should be 12 months' residence. 13. Troops on leaving hill stations for plains require no special precautions beyond being kept from unnecessary exposure. 14. With regard to change of stations; I do not think troops should be moved too frequently on the plains, except the station be a decidedly unhealthy one, in which case it ought not to be occupied by European troops at all. I think a move every three years often enough. More frequent moves are distasteful to married men, besides being unnecessary. 15, 16. No experience. 17. About 5 miles from the cantonment there is a hill on which accommodation for about 100 men has lately been provided. It is 617 feet higher than the station; it is cooler and the nights delightful. It is useful where a short change is required, but being on the top of a lonely and barren hill, there would be a total want of occupation, and men would suffer from ennui. Water has to be brought from a considerable distance, and baths would be very expensive. Supplies have to be brought from the cantonment. The place is only fit for a few men at a time. 18. From my experience, I should say that dry and sandy soils are most healthy for stations. 19. I do not think that soldiers should be sent to India before 18, between which age and 24 is, I think, the best age for soldiers proceeding to India. They should land in the cold season. The barrack accommodation at Bombay, where troops are landed, is very bad. It is, I believe, in contemplation to send troops when landed at once by rail to Khundala, on the line of the Ghauts, separating the Deccan from the Concan. This, for various reasons, would be attended with many advantages. Artillery recruits are sent off without delay to Poona and Ahmednuggur. 20, 21. I do not think it would be found convenient, nor would any benefit be derived from locating troops, intended for India, at any intermediate station, and therefore that they should be sent direct from the depôts. I would strongly advise that troops on landing should not, if possible, be delayed at Bombay, but marched direct to the railway. Those whose regiments were at a distance, to be located for a time at Khundala. Those for Poona and Ahmednuggur to proceed there at once; those for Sinde or the North-west Provinces could be sent to Kurrachee without landing at Bombay. Troops proceed direct to the interior by rail or macadamized roads. 22. With regard to the length of a man's service in India, my own opinion inclines to 12 or 15 years, or even more, provided he takes rational care to avoid unnecessary exposure and intemperance. A man who has served some years in India, and whose constitution is good, as will generally be the case if it is allowed fair play, has become acclimatized, and therefore is worth half a dozen raw unacclimatized lads, especially where the duty entails fatigue and exposure. Were short services adopted the State would lose the services of hardy, acclimatized, and useful men, to be replaced by raw lads, useless in India until they had served three or four years, which is nearly as long as the advocates of short service think a man should serve within the tropics. 23. As regards medical boards, it would be unbecoming in me to pass strictures on my seniors; I may, however, observe that I think the medical officer, under whose charge proposed invalids have been, is the person best qualified to judge as to what should be done with them, and that in all cases his opinion should have great weight, and not be set aside unless in certain rare instances, in which he was clearly in error. I have seen an instance of lamentable results attending the disregard of the regimental medical officer's opinion, and men returned to their regiments who had been recommended to be sent to Europe. 24. Invalids should leave India so as to arrive in England towards the end of spring or beginning of summer.
Diseases.	1. Health parades are discontinued in the artillery, on account of being exceedingly obnoxious to the men's feelings. Men are warned in all cases to present themselves in hospital at once. Nearly 20 years' experience has proved to me that health parades are needless. They should be abolished throughout the army. Failing immediate application, the men should have "with delay" marked against their names in the report book, and they should be obliged to make good all guards and other duties missed while in hospital. This or similar punishment would be found quite sufficient to prevent delay in application. 2. Only three cases of scorbutus have occurred among the European artillery at this station in ten years, and they were recruits from England. 3. The admissions from hepatic disease in the same arm here have been 2·3 per cent. of the total admissions from all diseases, or 1 in 44. The deaths, 8 per cent. of the total deaths from all diseases, or 1 in 13. This disease has decreased of late years. 4. Only 11 cases of dracunculus have occurred in 16 years in the artillery, among men who had arrived from stations where the disease prevailed. 5. The admissions from venereal diseases have been 12·5 per cent. of the total admissions from all diseases, or 1 in 8. Next to fevers and diarrhœa, this has been the most prevalent disease at the station. It is difficult to suggest any means of diminishing this liability

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	The only method would be inspection of the women. I think it would be highly advantageous to establish lock hospitals, but to be of use they must have suitable establishments attached to them. 6. *Fever* has been the most prevalent disease in the European artillery. The proportion of fever admissions to admissions from all diseases has been as 1 to 4, and the deaths from fever as 1 to 22 of the total deaths. Ephemeral, remittent, and continued fevers prevail in the hot months, and intermittents after the termination of the monsoon. The admissions from ephemeral fever 9·2 per cent., and from intermittents 14·5 per cent., of the total admissions. During the last 10 years, 29 cases of remittent, and 20 cases of continued fevers have been admitted. There were no deaths from ephemeral fever and intermittents. Four deaths took place from remittent, 4·6 per cent. of all deaths from disease. No deaths occurred from continued fever. *Dysentery.*—The admissions from dysentery have been 2·1 per cent. of the total admissions from disease. The deaths 21·8 per cent. of the deaths from disease. In some years it has prevailed very much, as, for instance, in 1854 and 1859, at the termination of cholera, when the greatest number of casualties occurred from it. *Cholera.*—The cholera admissions have been 1 to 132 of the total admissions, and the deaths from cholera 1 in 3 of the total deaths from disease. In 1854-1859, nearly two-thirds of those attacked died *Small-pox.*—Only 5 cases, and 1 death among the artillery in 10 years. *Rheumatism* has supplied 1 in 16 of the total admissions from disease. 7. The above, with diarrhœa, are the more common diseases at the station. Catarrh and throat affections are also common. Fevers are most prevalent in the hot months and after the rains. Hepatic affections during the hot months. Catarrh and throat affections at the conclusion of the cold and commencement of the hot months. As influencing disease at the station, the proximity of the village of Bhingar, already mentioned, is to be regretted. It is a refuge for bad characters from the camp; liquor is sold in it to the soldier. It is not under camp regulations, and is crowded, ill-ventilated, and dirty. The stations of the cantonment show that almost every epidemic has its origin in Bhingar. I believe that more than one ineffectual attempt has been made by the local military authorities to have the village removed, which would be an immense advantage if it could be carried out. 8. As regards the effect of habits and duties in predisposing to disease, the great bane of the soldier's life in India is want of occupation. It is that which leads him to drink, and so lays the seeds of disease. On entering a barrack room, for one man employed six will be found doing nothing. I have the most profound opinion that too great exertions cannot be used to furnish legitimate amusement and occupation for the men. Much has been done of late years, but a great deal remains to be done. The men, as a class, are not given to literary pursuits, although this is daily mending. For one man in the ranks who could read and write in former times, ten can do so now. It is well known that in the field in India, even during the hot weather, while there is excitement among the men, there is little sickness and epidemic disease. But if the exposure is kept up without excitement, the men are almost certain to be attacked by an epidemic. Hence Europeans should only be moved during the cold months, unless on unforeseen emergency. 9, 10. Quinine is not needed as a prophylactic. No recommendations to make as to precautions to prevent epidemic disease other than those in use.
V. Intemperance.	1, 2. The soldiers on the station are temperate. No confirmed drunkards. No record kept as to diseases occasioned by intemperance. Drunkenness, *per se,* is punished as an offence. 3. There is an exclusive privilege of sale of spirits in the bazaar, which fetched by auction 19,560 rupees for the current year. It is for natives. Mowra is chiefly sold. Spirits are not a component part of the soldier's ration at the station, it being optional to purchase liquor or not. The quality is $\frac{19}{25}$ spirits, and $\frac{6}{25}$ water; not more than two drams a day allowed to each man under any circumstances. It is not a habit among the men to take a dram before parade. On march spirits are a part of the ration, and invariably so in the field. Spirits are not given as rations to convalescents. No liquors injurious to health are sold by authority in the bazaars. 4. I do not consider the consumption of spirits by troops and convalescents conducive to health; on the contrary, I consider ardent spirits injurious to health. The quantity allowed (1 dram in quarters and 2 in the field) cannot be detrimental to efficiency and discipline. 5. I would abolish the use of spirituous liquors as part of the soldier's rations. The old soldier might feel the loss, but the young soldier would derive benefit from not acquiring the taste for ardent spirits, which, were it not part of the ration, he might never taste. 6. Beyond all comparison, I am of opinion that the use of malt liquor is preferable to that of spirits or wines. I consider the introduction of malt liquor for the use of the soldier as the greatest benefit that could have been conferred on him. And I am of opinion that the more the use of malt liquor is brought into play, and the less that of ardent spirits, the better it will be for the men. 7. I do not think that tea, coffee, lemonade, and soda water, and similar drinks, are much used at this station. I am in favour of abstinence altogether from spirits, but think that malt liquor in moderation is far preferable to the slops (ginger beer, lemonade, sherbets) which men are apt to drink when thirsty, and which are apt to induce diseases of the stomach and bowels. 8. I am of opinion that it would be beneficial to suppress altogether the spirit ration, and to substitute beer in its place. 9, 10. I would permit spirituous liquors to be sold in canteens only on particular occasions, and under the special and express sanction of the commanding officer. On such occasions, the spirit should be *the best of its kind* without regard to price. 11. The bazaar regulations for the sale of liquor are as follow. They are generally speaking obeyed.

HMEDNUGGUR: BOMBAY.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	"No licensed liquor seller residing in the cantonment shall on any pretence whatever give or sell liquor to any European soldiers, their wives or children. All cooks, cleaning boys, madrassis, and that class of natives who act as soldiers' servants, shall drink their liquor at the shops, and on no account shall they be permitted to take any away. For the observance of this rule the kilals shall be held responsible. The liquor sellers shall purchase their supplies from the liquor contractor, and from no other person. "All liquor shops shall be closed at 9 o'clock P.M., and not opened before gun-fire in the morning." (True extract.) W. V. JONES, Captain, Superintendent of Bazaar.
VI. DIET.	The canteen regulations in Jameson's code are strictly acted up to. 1. The composition of the ration in both European services is as follows:— 1 lb. bread - - - $\frac{5}{7}$ oz. of tea 1 lb. meat - - - $2\frac{1}{2}$ oz. sugar 4 oz. rice - - - 3 lbs. wood } per man. 1 oz. salt - - - 1 lb. vegetables No changes are made in this. Fresh vegetables are always given when in season. The constituents of the rations are inspected, first, by the European supervisors of the commissariat department, and then, previous to issue, by the regimental authorities. 2. A complete ration, including vegetables (no fruit) is allowed to every soldier. Non-commissioned officers and married men can each draw compensation in lieu, at the rate of three annas four pice a day, in which case they make their own arrangements for rations. Soldiers living in barracks take three meals a day; breakfast at 7 A.M.; dinner at 1 P.M., and tea at $4\frac{1}{2}$ P.M. 3. I think that the ration both as regards quantity and quality is good. There ought, however, to be a greater variety in cooking it. At present the vegetables and meat are served in the men's jamboos, and form a greasy indigestible soup-like mess. It would be better if the several messes had their meat roasted or boiled together in joints, and that the meat and vegetables should be separately served, when in cantonment. The rations cannot be sold by the men. 4. Food is cooked without any apparatus, by means of large copper cooking pots and pans. The kitchens are clean. The meat is boiled or baked, according to the wish of the men. 5. There are soldiers' gardens at this station. They are under regimental arrangement.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. In cold weather and rains the dress is cloth clothing. In hot seasons and on fatigue duties khakee and white clothing. The usual accoutrements. The serge tunic and trousers with great coat are sufficient for cold weather; the khakee, everything that could be desired for the hot. The dress on guard is according to season, and there are good guard rooms and sentry boxes. No improvement can be suggested. The late alterations in dress,—the helmet—doing away with the stiff stock, and making the clothing loose, the trousers narrower below than above, are great improvements as regards health and comfort. Every man should wear a flannel belt next the skin. To prevent foot sore is a most important object. To this end the boot should *fit well;* too great stress cannot be laid on this. The present practice of serving out boots of similar shape to men with differently shaped feet cannot be too much reprehended. Big ill-shaped boots chafe the feet after a march of a couple of miles. Small boots, if the man can march at all, will cover his feet with sores and corns, and the man's efficiency is compromised. It would require more trouble and somewhat more cost to introduce a better system, but both would be amply repaid by increased efficiency. The uppers and soles, both separate, but otherwise made, should be sent out to India, all of the largest size, and fitted and made up for each man on the spot. European shoemakers should be attached to each company for the purpose. The stocking should fit well, otherwise foot-sore will be occasioned. For a march soft woollen is best; for other duties cotton. When both boot and sock fit, the soldier should be taught to rub a little common brown soap on each heel and instep each morning before march, and with this trifling precaution (and taking off boots and socks before crossing streams) a soldier may march from the Himalayas to Cape Comorin without getting a sore foot. At present, the wonder is that every man who marches a dozen miles is not laid up with foot-sore.
Duties.	1. I do not think, as far as health is concerned, that any object would be gained by having the men thoroughly drilled before coming out to India. But I am of opinion that it would be highly advisable that the first year of a recruit's life in India should be passed in as good a climate as possible. 2. I do not think men suffer from drills or parades, provided they are not of too long duration and are at proper hours. 3. Morning is the proper time for drills and parades. They should be concluded before the sun has any power, especially in the mounted branches of the service, the men having stables afterwards. In marches the men should arrive at their camping ground as soon after sunrise as possible. This is the usual custom. The reliefs are as follows:—*European:* cavalry, 15; artillery, 10; infantry, 8. *Native:* cavalry, none; artillery, $3\frac{1}{2}$; infantry, 9. 3. Guards mount from private parade grounds and are relieved daily. Night roll calls are only resorted to when circumstances require them. Night guards are not detrimental to health, and no additional precautions are required than those usually adopted under existing regulations.
VIII. INSTRUCTION AND RECREATION.	1. The *station* is supplied with ball courts, skittle ground, schools, library and reading room. There are also regimental soldiers gardens, besides workshops and a theatre. There are no day rooms, and no gymnasium. There are soldiers' savings' banks. The recreations are sufficient, but should be more extensive for the station. There are restrictions on exposure during the heat of the day in hot seasons, but not during the rains or in cold weather. 3, 4. There is sufficient shade to enable the men to take exercise, without injury to health.

References to Subjects and Questions.	Replies.
IX. Military Prisons.	1. The cells are 10 feet by 10 feet. I would suggest their being considerably increased in size.
X. Field Service.	1. There are no local regulations for field service. 2. The recommendations of the medical officer on a march are invariably weighed and considered. 3. The medical officer can remonstrate, which I consider sufficient. 4. Arrangements as to field hospitals, &c., are conducted under the superintendence of the Principal Inspector General, Medical Department.
XI. Statistics of Sickness and Mortality.	1. The following are the statistics of the station:—

European Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1857-58	Detachment H.M. 33rd Regiment -	19	—	—	1	—	—	—	—	—	—	—	2	—	—	—	19	—	22	—	121·0	—
1858-59	Detachment H.M. 3rd Dragoon Guards. Detachment H.M. 18th Royal Irish - Detachment H.M. 33rd Regiment - Detachment H.M. 57th Regiment -	334	175	—	1	1	46	—	12	—	80	1	18	—	—	—	393	1	725	3	217·0	0·8
1859-60	Wing H.M. 3rd Dragoon Guards - Detachment H.M. 28th Regiment - Detachment H.M. 56th ditto - H. M. 57th ditto -	709	1,550	7	4	1	96	2	18	1	294	15	9	1	—	—	383	3	2,354	30	332·0	4·2
	European Troops in the Indian Army.																					
1850-51	1st Battalion Artillery - -	381	352	—	—	—	29	—	18	—	220	4	51	—	1	1	369	1	1,040	6	272·9	1·5
1851-52		505	311	—	1	—	40	1	12	1	178	1	49	—	2	1	445	1	1,038	5	205·5	0·9
1852-53		463	235	—	—	—	48	1	17	—	145	4	34	—	—	—	388	—	867	5	187·2	1·0
1853-54		435	115	—	—	—	46	1	18	3	90	2	20	—	2	2	382	—	673	8	154·7	1·8
1854-55		311	117	—	1	—	25	—	18	1	195	10	24	—	30	19	284	—	694	30	223·1	9·6
1855-56		268	156	1	2	1	22	1	21	—	76	—	18	—	—	—	221	2	516	5	192·5	1·8
1856-57		196	81	—	1	—	24	—	—	—	57	—	11	—	1	—	192	—	377	—	192·3	—
1857-58		155	26	—	1	—	20	—	10	—	40	—	9	—	—	—	154	—	260	—	167·7	—
1858-59	1st Battalion Artillery - - Depôt 3rd European Regiment -	276	113	1	2	—	99	2	3	—	109	1	44	—	—	—	472	—	854	4	309·4	1·4
1859-60	1st Battalion Artillery - Depôt 3rd European Regiment -	344	251	2	10	—	86	2	22	2	231	8	60	2	14	9	375	1	1,040	26	302·3	7·5

Native Troops.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
1850-51	1st Battalion Gun Lascars - 3rd Battalion Artillery - 7th Regiment N.I. - 26th do. do - 5th Company 4th Battalion Artillery	1,267	561	1	5	—	14	—	4	1	134	2	12	2	3	—	511	4	1,244	10	98·1	0·7
1851-52	1st Battalion Gun Lascars - 3rd Battalion Artillery - 26th Regiment Native Infantry -	1,116	309	1	6	—	11	1	2	1	92	—	9	1	—	—	319	2	748	6	67·0	0·5
1852-53	1st Battalion Gun Lascars - 4th Battalion Artillery - 4th Company 4th Battalion do. - 3rd Battalion Artillery - 26th Regiment Native Infantry -	1,085	361	2	5	—	13	—	2	—	108	2	7	—	—	—	361	2	857	6	78·9	0·5
1853-54	1st Battalion Gun Lascars - 4th Battalion Artillery - 6th Company 3rd Battalion Artillery 4th Company 4th do. do. 26th Regiment Native Infantry -	1,061	295	—	4	—	28	2	3	—	84	1	11	—	—	—	380	3	805	6	75·8	0·5
1854-55	1st Battalion Gun Lascars - 4th Battalion Artillery - 24th Regiment Native Infantry -	963	268	3	6	—	9	—	3	—	97	1	14	2	8	2	268	1	673	9	69·8	0·9
1855-56	1st Battalion Gun Lascars - 4th Battalion Artillery - 4th Company 4th Battalion do. - 24th Regiment Native Infantry -	1,101	459	1	3	—	31	2	5	—	206	1	13	—	—	—	366	1	1,083	5	98·3	0·4
1856-57	1st Battalion Gun Lascars - 4th Battalion Artillery - 24th Regiment Native Infantry -	971	288	1	3	—	22	5	3	1	78	—	17	1	—	—	297	3	708	11	72·9	1·1
1857-58	1st Battalion Gun Lascars - 4th Battalion Artillery - 5th Regiment Native Infantry -	988	598	6	48	—	20	2	2	—	158	2	4	—	5	2	737	1	1,572	13	159·1	1·3
1858-59	1st Battalion Gun Lascars - 4th Battalion Artillery - 5th Regiment Native Infantry - 22nd do. do. -	1,079	365	1	24	1	15	1	7	—	87	—	11	2	—	—	615	2	1,124	7	104·1	0·6
1859-60	1st Battalion Gun Lascars - 4th Battalion Artillery - 22nd Regiment Native Infantry - Depôt 24th Regiment do. -	1,189	1,132	2	6	—	21	1	3	2	161	5	8	1	5	1	485	1	1,821	13	153·1	1·0

AHMEDNUGGUR. BOMBAY.

EUROPEAN WOMEN AND CHILDREN.

Years.	Station.	CORPS.	WOMEN. Strength. Europeans.	Indo-Europeans and Natives.	Total.	Treated. Europeans.	Indo-Europeans and Natives.	Died. Europeans.	Indo-Europeans and Natives.	Ratio per Cent. to Strength. Treated.	Died.	CHILDREN. Strength. Europeans.	Indo-Europeans.	Total.	Treated. Europeans.	Indo-Europeans.	Died. Europeans.	Indo-Europeans.	Ratio per Cent. to Strength. Treated.	Died.
1852-53	Ahmednuggur.	1st Battalion Artillery	36	28	64	56	28	1	1	131·2	3·1	38	29	67	67	49	6	1	173·1	10·4
1853-54		Ditto	38	30	68	25	22	—	—	69·1	—	40	35	75	66	42	6	2	144·0	10·6
1854-55		Ditto	29	26	55	46	29	1	2	118·1	5·4	34	31	65	62	41	6	6	158·4	18·4
1855-56		Ditto	33	24	57	48	19	—	—	117·5	—	54	34	88	79	12	—	4	103·4	4·5
1856-57		Ditto	36	22	58	54	29	1	—	143·1	1·7	67	31	98	108	40	9	5	151·0	14·2
1857-58		Ditto	44	26	70	38	23	—	—	87·1	—	71	31	102	133	44	16	10	173·5	25·4
1858-59		Ditto	36	22	58	51	12	—	1	108·6	1·7	49	28	77	59	10	1	—	89·6	1·3
1859-60		Ditto Depôt 3rd European Regiment	71	27	98	87	18	3	1	107·1	4·0	93	35	128	85	23	13	1	84·3	10·9

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, 27th July 1860.

W. C. COLES, Assistant-Surgeon,
Secretary.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1, 2. The hospital is situated to the south-west of the barracks and is adjacent to them. The horse lines are in front or west side of the hospital, and distant about 200 yards. The hospital is at a considerable distance from the bazaar, and the only houses near it are those of the officers at the rear of the building. The site is open and freely ventilated. There are no houses, walls, &c., to interfere with this. It is healthy as to elevation, drainage, absence of malaria from river banks, nullahs, ditches, or any other nuisance. 3. The water supply is abundant and wholesome. 4. The refuse water is carried away by means of drains which lead to cesspools outside the hospital, from which it is removed and taken to a distance from camp. 5. All the ward floors are raised four feet above the surface of the ground. They are of stone. There is no perflation of air below the floors. There is no provision made for conveying away the roof water which sinks into the subsoil. There are superficial gutters for carrying away surface water. The hospital is built of brick with a tiled roof; both walls and roof are single, but sufficiently thick to keep the hospital cool. There is a verandah, eight feet wide, on both sides, which with *chicks* afford sufficient shelter from the sun's rays. The verandahs have on occasions of emergency been used as accommodation for sick, for which they are not well adapted. Parts of the verandahs are used as places (they cannot be designated as rooms) for eating meals in, there being no rooms for that purpose. There are three wards, all on the ground floor, and 60 beds. The following are the particulars of the accommodation:— Date of construction, 1831; raised and otherwise improved, 1856; wards, 3; beds, 60.

Wards.	Regulation Number of Sick per Ward.	Dimensions of Wards. Length.	Breadth.	Height, Mean.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area per Bed in Feet.	Height of Bed above the Floor.	Windows. Number.	Height.	Width.
										Ft. In.	Ft. In.
1	20	70	24	24	40,320	2,016	84	1½	Top - 18 Bottom 10	4 0 6 7	3 0 3 0
2	20	64	24	24	36,864	1,843	76·9	1½	Top - 19 Bottom 11	4 0 6 7	3 0 3 0
3	20	64	24	24	36,864	1,843	76·9	1½	Top - 19 Bottom 11	4 0 6 7	3 0 3 0

The hospital is so placed as to receive the full benefit of prevailing winds. There are two sets of windows in each ward, one below and the second six feet higher up. The lower windows open in the centre, having a fan above, which can be opened or shut independently of the rest of the window. The upper windows are on a pivot in the centre, and are opened and shut by means of a rope. This double set of windows is most conducive to ventilation and coolness.

6. The windows are used for ventilation and are sufficient to keep the wards free from odour or closeness. The upper windows have jalousies, opened and shut by a rope. The lower windows have none.
7. There are no means of cooling the air. Shutting the wards up by day in the hot weather being sufficient, while the nights are always cool and pleasant.
8. No means of warming are necessary.

The walls of the wards, &c., are whitewashed every three months or oftener if necessary.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	9. Privies and urinals are at a short distance from the hospital, and connected by covered passages. The drainage is good, leading to cesspools outside, from whence the contents are removed by hospital sweepers, and taken to a distance by night carts. Water is freely used in the urinals, by which, and the use of deodorizing agents, both privies and urinals are kept quite free from noxious or offensive exhalation. 10. The bathing apparatus in India is in general very simple; copper handbasins and wooden tubs with slipper baths for those requiring hot baths near their bed side. The artillery hospital has also shower baths, and the lavatories are being enlarged. 11. The bathing rooms, when enlarged, will be sufficient for sick. 12. Hospital clothing is washed at a distance by native washermen and returned fit for use. 13. The storage is sufficient and dry. 14. The hospital cots are of iron painted, some having iron, some tape bottoming. The mattress is made of straw, bed-clothes according to season. Sheets, blanket, and counterpane in cold weather. No blanket in the warm season. Iron cots all that could be desired. 15. The cook room is convenient, and contains everything necessary for cooking diets. 17. The hospital attendance consists of the hospital serjeant and ward boys, in numbers proportioned to the sick. Patients who wish it may have a comrade as orderly to attend on him. The attendance is sufficient. 18. The sanitary condition of the artillery hospital at this station is very good. No gangrene or pyæmia. Cholera has appeared in it as elsewhere. 19. The only deficiency in the hospital is a convalescent's dining room. They dine in the verandah at present, but anything is better than dining in the wards; among other reasons, because flies, which are a pest of the first magnitude in India, are attracted by it. Such dining rooms are required for all hospitals. 20. There are grounds but no shaded walks where convalescents can take exercise. 21. There is a female hospital, with matron and assistant matron, for the wives and children of the artillery. The accommodation is not sufficient. Alterations have been recommended, but deferred. 22. There are no special hospital regulations for this station. 23. The hospital is under the direct control of the medical officer. He can suggest and make requisitions for repairs, change the diets and prescribe comforts, subject to the supervision of the superintending surgeon of the division. 24. There is no convalescent ward.
XIII. Burial of the Dead	1, 2. The burial ground is within camp limits, but at the outskirts. Its position as regards prevailing winds is favourable. Area, 300 feet by 200 feet. Soil, morum (schist); subsoil, white clay. Decomposition takes place very readily; the grounds are carefully kept. 3. Grave space 7 feet by 2 feet. Two feet between the graves. Depth of graves, 5 feet. Not re-opened except vaults, which are hermetically closed over each coffin. Interment takes place within 12 hours, always within 24 hours after death; in cases of cholera or epidemics, as soon as possible. 4. The grave yard is never offensive. 5. The dead of camp followers and bazaar people are either burnt or buried according to the customs of their caste. The burial ground and place of cremation are on the outskirts of camp. 6. No injury to health accrues from the present practice of burial, and 7. No improvement in the regulations can be suggested.

21st June 1860.

J. Hobson, Brigadier.
W. L. Cameron, Surgeon, 1st Batt. H.M.B. Artillery.
A. U. H. Finch, Capt. Engineers.

ADEN.

Accommodation	Queen's Troops	Artillery	140.	This is to be doubled—sanction obtained.
		Infantry	350.	To be increased to 500—sanction obtained.
	Native Troops	Artillery	100.	
		Infantry	1,100.	

References to Subjects and Queries.	Replies.
I. Topography.	1. Aden is a peninsula connected by a narrow neck of land with the sandy plains of the interior of Arabia. The country is nearly flat for miles, but there are high and lofty hills in the distance. There is no wood or jungle in the vicinity. 2. The cantonment at the upper end of the crater is 123 feet above the level of the sea at high tide, but the adjacent country is almost on the level of the sea for miles. The only high and healthy ground adjoining the station is Mur Shag hill, about 300 feet above high tide, which juts out into the sea a considerable distance in an easterly direction, and is therefore under the influence of both monsoons, the prevailing winds thus passing freely over it fresh from the sea without being raised in temperature by coming over any land. The difficulty of access and transport for water and provisions throw great obstacles in the way of its being used for military purposes. 3. There is no mountain or table land at all available as a military site. 4. The nearest water is at Shaik Othman, about five miles in the interior. The vicinity is not generally liable to an overflow of water; but when the violent thunder storms occur, which is usually about once every three years, the crater of Aden, on which the camp and town are situated, is overflowed for a few hours; the water, however, is soon carried off into the sea, or sinks into the subsoil, which is of a very absorbent nature. There are no water pits, but two or three ravines exist, formed by the Shum Shum range of hills. They are not prejudicial to health.

ADEN.
BOMBAY.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	5. The station is free and open to the winds in an easterly direction, and although surrounded towards the west by very high hills, the winds when blowing from that quarter are too high to be much impeded by them. There are no trees, hedges, walls, or houses that can interfere with free ventilation. In the part of the cantonment occupied by the native troops the temperature is raised several degrees by reflected heat. The station is exposed to no cold winds. The wind varies but little in its direction, blowing, when the periodical monsoons set in, from the S.W. for five months, viz., from May to September, and from the E. and N.E. for the remaining period of the year; the force of it, however, varies considerably. When the S.W. monsoon sets in, the camp itself becomes exceedingly hot, from the temperature of the air being greatly raised by the wind blowing over the high hills surrrounding the cantonment. At the other season a fresh cool sea breeze blows constantly into camp. 6. The surrounding country is not cultivated, there being no works of irrigation or any water in the vicinity of the station. 7. The town of Aden is situated close to military limits, and contains 25,000 inhabitants. 8. The district is of volcanic formation, the soil and subsoil of the station being formed of the disintegration and washing down of the surrounding rocks, combined with that thrown up by the sea. The town, &c. is built upon the *débris* of former buildings. 9. The average depth at which water is found in the dry season is 140 feet below the surface. There is no rainy season. 10. The rain-fall sinks into the subsoil, which is of a very absorbent nature, or is soon carried off into the sea. There are no surface springs. The drainage from the Shum Shum range of hills and Munsoorie heights passes into the subsoil of the station. 11. The water supply of the station is derived from wells. Tanks to contain about 10 or 12 million gallons, collected from the drainage of the Shum Shum hills, are in progress, called "Taweela Valley Tanks;" and one condenser at the Isthmus, and two at Steamer Point, are nearly ready for use, and they will yield, it is believed, between them 500 gallons the hour. The tanks contain, at a rough estimate, 30,000 feet square, but are at present empty. There are three reservoirs at the Isthmus, covered in, which are full, and contain one million gallons between them; they were filled by hand, but they will in future be made use of to store condensed water in as soon as the engine is working. No tanks for drinking purposes are also used for bathing. The wells are not liable to pollution from any source. 12. The amount of drinking water is limited, but will, it is expected, be much increased shortly, when the Taweela tanks are completed and the condensers in full working order. The composition of the water of wells, which form the chief source of supply to the inhabitants for drinking purposes, is—

Specific Gravity, at 60° F.	Banian, 1007·2.	Parsee, 1006·2.	Turkish Well, 1005·1.	Taweela.
Chloride of sodium - - -	32·93	29·80	30·88	19·63
„ magnesium - - -	10·11	11·50	10·97	6·35
„ calcium - - -	14·75	13·29	11·05	15·96
Sulphate of soda - - - -	13·69	7·62	8·40	5·63
Nitrate of lime - - - -	14·09	5·23	4·50	—
Carbonate of magnesia - - -	·35	·31	·45	—

The water supplied to the troops for drinking purposes, first sort, is on the whole good, but the supply is very limited. The water is raised by bullock power, and distributed through camp on donkeys and camels. In the event of our present prospects of obtaining a good supply of water failing, it can always be obtained in any quantity at Shaik Othman, and brought in on camels; or, as formerly, an aqueduct might be constructed, the ancient one not being repairable.

13. There are no other topographical points bearing on the health of the station, not included in these queries.
14. All stations are selected by a committee of experienced officers, two of whom are the medical officer and engineer. There is no improvement in this to be suggested.

II. CLIMATE.

1. There are no instruments for meteorological observations at this station, except the thermometer supplied to the hospital.
2. TABLE of Meteorological Observation prepared on the only available data, being One Year's Observation from January 1859 to December 1859.

Month.	Mean Temperature.	Month.	Mean Temperature.
January - - -	76	July - - -	93
February - -	78	August - - -	93
March - - -	83	September - -	89
April - - -	87	October - - -	81
May - - -	90	November - -	82
June - - -	94	December - -	76

3. The climate is equable throughout the year from its vicinity to the sea; and for the same reason there is in general a good deal of moisture in the atmosphere. The temperature is pretty high, and the effects of the sun's rays are always powerful. There is no cultivation. At times, especially in the hot months, clouds of dust envelop the camp, but beyond the temporary annoyance, there are no bad effects to the health of the troops, excepting some slight cases of ophthalmia at times. The troops are generally pretty healthy; the diet and clothing require to be light, and the shelter the best procurable from the sun's rays. Every precaution is taken as to the amount, nature, and times for drills, duties, and exercise. In general the most

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	healthy months at the station are those of the cold season, from November to March. May and September may be considered as the most unhealthy months. The most prevalent diseases then are fevers, diarrhœa, and scurvy. 4. Beyond a removal from the camp to Steamer Point, a distance of about six miles, or to Mur Shag hill, about a mile off, there are no other places where an invalid can be sent without taking a long sea voyage, either to Bombay or by the homeward route. 5. Captain Fuller has served at Poona, in the Poona districts, and Concan. He prefers the Concan to the Deccan, although most people prefer the latter. The climate of the former is moist, that of the latter dry; but, in his opinion, the climate of Aden is generally more salubrious and healthy than either of the above. Major Lynch has served at almost every station in the Bombay Presidency, and has found but little, if any, difference as regards salubrity. Belgaum and Poona are generally considered the most healthy stations. Dr. Davidson has served chiefly in Sinde and Guzerat, Rajpootana, and Aden. His stay at other places was too short to form an opinion. Sinde was decidedly the most unhealthy. The others, for India, were comparatively salubrious.
III. Sanitary Condition of Station.	1, 2, 3. A map of the adjacent country and plans of the station and barracks are transmitted. 4. Table of Barrack Accommodation. Date of construction:— Isthmus barracks, 1853–58. Infantry barracks, front bay, 1857–60. Old artillery barracks, unknown. Native infantry regiment barracks, 1857–58. Sappers and Miners barracks, 1858. Total number of rooms or huts, 106. Total regulation number of non-commissioned officers and men, 1,980.

	Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
For two companies of infantry in Front Bay. Men's quarters	4	46	120	24	$\frac{25+18}{2}=21\frac{1}{2}$	61,920	1346·08	62·608	1½	16	6	4
Serjeants' do.	8	2	33¾	10	$\frac{18+12}{2}=15$	5062·5	2531·25	168·75	1½	4	6	
1 patchery for married men of one company.	12	2	16	14	$\frac{13+19}{2}=16$	3,584	1792·	112	—	3	4	3
2 ditto under construction, each for 12 married men.	12	2	14	9	$\frac{7+13}{2}=10$	1,260	630·	63	—	Three doors (6 × 4) to these rooms.		
Isthmus barracks. Men's quarters	2	46	116	24	$\frac{20+28}{2}=24$	66,816	1452·5	60·5	—	16	8½	5
Serjeants' do.	2	2	14	10	24	3,360	1680·	—	—	1	8½	5
Old artillery barracks will be pulled down on new ones being built. No. 1 barrack	1	32	88	20½	$\frac{12+21}{2}=16·5$	29,766	931·8	56·3	—	23	5	3
No. 2 do.	1	32	110	12	$\frac{7·5+16·5}{2}=12$	15,840	495·	41·2	—	No windows. The walls have several trelliswork openings to answer the purpose of windows.		
Native infantry regiments	56	24	80	20	$\frac{6+10}{2}=8$	12,800	533·	66·6				
Sappers and Miners	8	16	80	20	8	12,800	800·	100·				
Guard-room, under one roof	—	4	30	20	$\frac{13+18}{2}=15\frac{1}{2}$	9,300	2325·	150·	—	6	4	3
1 cell do. do.	—	1	10	9½	15½	1472·5	1472·5	9·5	—	2	4	3
1 do. do.	—	1	10	9½	15½	1472·5	1472·5	9·5	—	2	4	3
Prison cells under one roof, with clear space between each of 10 feet — 4 each.		1	10	5	$\frac{18+13}{2}=15·5$	775	775	50	—	4	1½	1½

N.B.—Barracks with subsidiary buildings for one company of artillery in camp at Front Bay, and ditto ditto for one company of artillery on Ras Tarshyne, and ditto ditto for two companies of infantry on Ras Tarshyne have been sanctioned, and will be built in due course.

5. The windows are on opposite sides in barrack rooms, and open towards the outside in the Front Bay barracks, and towards the inside in the Isthmus barracks. There is a verandah on both sides. In the infantry barracks at Front Bay the verandahs are double, the interior verandah being 10 ft. in width, and the exterior one being 7½ ft. wide. The Isthmus barracks have single verandahs on both sides, 12½ ft. in width. The verandahs are used as sleeping quarters at present, on account of the limited

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	accommodation, a wing being accommodated in the barracks for three companies. There are no properly constructed jalousies or jhilmils. 6. Planks on iron trestles are used for bedsteads in barracks, and the bedding is of carpets. No improvements are suggested. 7. The tents are made of good Dungaree, of three folds of cloth, white outside and blue inside. The following Table shows their dimensions, cubic space, &c. :—

Description of Tents.	Dimensions of Tents.			Europeans.													
	Length.	Breadth.	Height.	Cubic Contents.	Artillery, with Harness.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Cavalry with Saddles.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Foot Artillery and Infantry.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Staff Serjeants.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.
European soldiers, two poled	22½	14	$\frac{6+12}{2}=9$	2,835	14	202½	22½	16	177⅜	19 11/16	22	128 19/22	14 7/22	2	1,417½	157¼
European soldiers, single poled	14	14	9	1,764	8	220½	24½	10	176⅖	19⅗	13	135 0/13	15 1/13	1	1,764	196
European soldiers' hospital, single poled	14	4	9	1,764	12	147	16⅓	15	117⅗	13 1/15	20	88⅕	9⅘	2	882	98
Staff serjeants, single poled	14	14	9	1,764	4	441	49	5	352⅘	39⅕	6	294	32⅔	1	1,764	196
Native cavalry, single poled	11	10	$\frac{6+11}{2}=8½$	935	8	116⅞	13¾	10	93½	11	13	71 11/13	8 6/13	1	935	110
Native infantry, single poled	11	10	8½	935	7	133 4/7	15 5/7	9	103 8/9	12⅔	12	79 7/12	9⅙	1	935	110
Hospital, single poled	11	10	8½	935	12	77 11/12	9⅙	15	62⅓	7⅓	20	46¾	5½	2	462½	55

Description of Tents.	Natives.									For Hospital.					
	Cavalry, with Saddles.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Golundauze Infantry Sappers.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Native Officers.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Europeans.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Native.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.
European soldiers, two poled	—	—	—	—	—	—	—	—	—	12	236¼	26¼	15	189	21
European soldiers, single poled	—	—	—	—	—	—	—	—	—	8	220½	24½	10	176⅖	19⅗
European soldiers' hospital, single poled	—	—	—	—	—	—	—	—	—	12	147	16⅓	15	117⅗	13 1/15
Staff serjeants, single poled	—	—	—	—	—	—	—	—	—	4	441	49	5	352⅘	39⅕
Native cavalry, single poled	25	37 10/25	4⅖	30	31⅙	3¾	4	233¾	27½	8	116⅞	13¾	10	93½	11
Native infantry, single poled	18	51 7/18	6⅓	22	42½	5	4	233¾	27½	7	133 4/7	15 5/7	9	103 8/9	12⅔
Hospital, single poled	—	—	—	—	—	—	—	—	—	12	77 11/12	9⅙	15	62⅓	7⅓

8. The barracks are ventilated by teak wood trellis work in the walls over each door and window 2 ft. high, and the same breadth as the door and window, and are within about 2 ft. of the top of the room. There are also openings in the roof formed by decreasing the slope in places. The ventilation is sufficient to keep the air pure night and day. No cooling apparatus is necessary in the barrack rooms, as the barracks are well open to the breeze at all seasons. Punkahs have been recently erected on account of the excessive sickness among the 4th King's, recently arrived from unhealthy Indian stations.

9. The Isthmus barrack walls are built of rubble and chunam. The roof is a framing of teak with a covering of jawlies. The doors and windows are of teak. The Front Bay barrack walls are of wattle and daub nine inches thick (that is, timber framing covered and plastered with mud). The roof is of jawlies, and the doors and windows of teak. The sepoys' huts are a framing of Zanzibars, with Aden rafters, the walls and roof being covered with mats and jowlies.

10. The floors are paved, and in the Isthmus barracks are over an arched ground floor. In the Front Bay barracks the space between the plinth walls under the stone paving is filled in with dry rubble. The height of the floors above the ground is 2 ft. 9 in.; there is no passage of air beneath them.

11. The materials and construction of the barracks, huts, and tents are suitable for the climate; but the Front Bay barracks would have been more durable if the walls had

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	been built of rubble and chunam, instead of wattle and daub. In future all barracks and public buildings will be built of rubble and chunam, as approved by Government. The slope of the jowlie roofs in the above barracks is too little to let the rain run off freely, being only 30°.' This slope ought to be 45°; and all roofs will be hereafter built to that angle, which will heighten the walls, and make the barracks cooler. The walls of Isthmus barracks are of rubble masonry, and similar to the above in other respects. The barracks and cantonment are kept in repair by the executive engineer and barrack-master; the latter has charge of all military buildings, and he is responsible for their sanitary state. Repairs are executed immediately their necessity is brought to notice. There are no ceilings to barracks. The walls are generally coloured and whitewashed once every two years. 12. There are no baths; the men bathe in the sea. 13. The barrack cook-houses are supplied with water by bheesties or water-carriers. The refuse water is allowed to soak into the subsoil. There are plenty of native washermen for washing and drying the linen. 14. The privies are cleaned by sweepers night and morning, and the contents burnt in furnaces built for the purpose. The urinals are flushed by the drainage of the wash-houses, and the contents flow into cesspools. 15. These buildings are ventilated by an open trellis work of Aden bamboos. The barracks are lighted by common lanterns, in which oil is burnt. 16. All drainage from barracks is allowed to sink into the subsoil, which is of a very absorbent character. The contents of urinals and wash-houses are received into cesspits. These cesspits are not in the vicinity of any wells. The cesspits at Isthmus barracks are 72 feet from the urinals in the barracks; they are 10 feet in diameter, and 6 feet deep. Those at Front Bay barracks are 20 feet from the urinals, are 10 feet in diameter, and 7 feet deep, and 40 feet from the nearest barracks. No cesspools are near the hospital. The subsoil absorbs the contents of the cesspools. There are no foul ditches. 17. Refuse and manure are conveyed away daily in carts, under the direction of the barrack-master, and burnt in furnaces in Halkut Bay. The cantonment is kept clean. 18. The surface of the cantonment is naturally free from vegetation. There are no old walls, thick hedges, &c. interfering with the ventilation. 19. The Sudder bazaar is situated at the north-west end of the cantonment, and is in close proximity to the lines of the 29th native infantry, and sappers and miners. A few officers' houses are also in the vicinity. With respect to drainage, there are no regular drains near to the Sudder bazaar, but they are not required, the ground on which the shops are built being elevated and dry. The ventilation is good, and water is supplied from the Government wells in the Khusaf valley. In regard to cleanliness, care is taken that no nuisances are committed in or near the bazaar; in the rear of the shops a privy has been constructed, resorted to by the residents, and the men and followers of the native regiments. The houses are in no way crowded, and to preserve cleanliness the bazaar peons are stationed in different parts of the camp to see that nuisances are not committed in unauthorized places. We do not think that any improvement can be effected in the sanitary condition of the bazaar. The general condition of the native houses is good, and there are no dungheaps or cesspits within them. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. The distance from the place where animals are slaughtered to the station is about a mile. It is situated in the civil limits, and the entrails of the animals are buried in a spot set apart for the purpose. No inconvenience is experienced, and we can suggest no improvement in the present arrangements. 21, 22. The bazaar followers do not possess horses; all animals are stabled in the civil limits. There are no cavalry or artillery stables, nor any picketing grounds. 23. At present there are quarters for 12 married men of the infantry in Front Bay; eventually there will be quarters for 24 more, equal to the full allowance of married men to three companies located in Front Bay and the Isthmus. No barrack rooms are occupied by married men. Quarters for 12 married men of a company of artillery are sanctioned in Front Bay, and for 12 for a company of artillery at Ras Tarshyne, and for 24 married men for two companies of infantry at the same place.
Officers' Quarters.	1. There are no public quarters for officers.
IV. Health of the Troops.	1. The station may be regarded as healthy both for the troops and inhabitants. 2. Among the native population ulcers, small-pox, and fever seem to be the general diseases; spleen disease is not of common occurrence. 3. The native population may be considered generally as healthy, from there being little malarious influence and the attention paid to the general cleanliness of the place. 4. A wing of Her Majesty's 4th, or Queen's Own, arrived about six months ago from Ahmedabad, where they had been stationed for 18 months, and where they enjoyed good health on the whole, fever being the chief complaint. About 100 men of the 13th brigade, royal artillery, arrived in October 1858 from Surat, where they had been stationed about five months, and suffered a good deal from fever and dysentery. They did not enjoy good health on their arrival, but are now healthy. During their stay here the chief diseases have been fever and bowel complaints. Their accommodation is very good, and all equally healthy. 5. The troops cannot be camped out unless on emergencies. 6 to 16. No experience of hill stations. Frequent change of station in the plains is beneficial to the troops. 17. There is no higher ground near the station which could be advantageously occupied as a hill station.

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References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	18. A dry, sandy, or gravelly soil is to be preferred for stations.
	19. Soldiers proceeding to India should be from 17 to 25 years of age, and they should land there from November to April. Troops on landing are at once marched to barracks. Recruits on first landing in India, if in Bombay, should be sent to Poona immediately, to remain there until acclimatized.
	20. Troops should be sent direct from the home depôts to India.
	21. At Aden troops land at Steamer Point, and march up to the camp, the luggage being conveyed on carts. No additional precaution is required for the preservation of the health of the troops on the route.
	22. The period of a British soldier's service in India should be from 14 to 20 years, dependent on the station they are likely to serve at.
	23. The manner of conducting medical boards at out-stations, as existing in the Bombay army, seems to prove satisfactory as to invaliding.
	24. Invalids should leave India for home at any time, so as not to arrive either in the early spring or in the winter. Their time of departure must be regulated by the route chosen.
Diseases.	1. A medical inspection of the European troops takes place weekly. Such is not required, nor would it prove serviceable for native troops.
	2. The European troops for the last two years may be said to have been exempt from scorbutic complaints, but scurvy has been rather frequent among the native troops, the proportion being 10·6 of other diseases. It is attributable to the limited supply of good fresh drinking water; the better sort of vegetables are also dear and scarce. Tanks on a large scale are now being constructed to retain the little rain water that falls, and Government condensing apparatus are now also being erected.
	3. The following Table shows the proportion of hepatic diseases and scorbutus under treatment, to the total admissions and deaths from all diseases for the years ending 31st March 1858 and 1859:—

	1858.		1859.		Total.	
	Admissions.	Deaths.	Admissions	Deaths.	Admissions.	Deaths.
Total admissions and deaths from all diseases in the European troops -	186	3	645	15	831	18
Total admissions and deaths from all diseases in the Native troops - -	589	8	779	90	1,368	98
Total of scurvy cases admitted in the European troops - - - -	1	—	—	—	1	—
Total admissions of scurvy cases in the Native troops - - - -	25	2	70	2	95	4
Total admissions from hepatitis in the European troops - - -	—	—	10	1	10	1
Total admissions from hepatitis in the Native troops - - - -	2	—	—	—	2	—

4. No well authenticated case of dracunculus, having its origin in Aden, is known.

5. The proportion of sick from venereal diseases to that of others bears no constant ratio. At times the hospitals will be completely free from any venereal complaints, whilst at others numerous admissions will take place. The most obvious precaution is increased encouragement to marriage; and it is certainly advisable that some sort of surveillance should be kept over the public women.

TABLE of Admissions from these Diseases for the Years 1858 and 1859, showing the Per-centage upon the Total of Admissions from all other Diseases:—

EUROPEAN TROOPS.

Diseases.	1858.		1859.		Per-centage	
	Total Admissions.	Total Deaths.	Total Admissions.	Deaths.	Admissions on Total Admissions.	Deaths on Total Deaths.
Syphilis primitiva -	13	—	12	—	3·00	—
„ consecutiva -	2	—	3	—	0·60	—
Ulcus Penis non Syphilitica	1	—	2	—	0·36	—
Bubo simplex - -	13	—	12	—	3·00	—
Gonorrhœa - -	7	—	10	—	2·05	—
Orchitis - - -	—	—	1	—	0·12	—
Phymosis - - -	—	—	1	—	0·12	—

References to Subjects and Queries.

IV. Health of the Troops —*Diseases—cont.*

Replies.

Native Troops.

Diseases.	1858. Total Admissions.	1858. Total Deaths.	1859. Total Admissions.	1859. Total Deaths.	Per-centage. Admissions on Total Admissions.	Per-centage. Deaths on Total Deaths.
Syphilis primitiva -	19	—	—	—	1·38	—
„ consecutiva -	16	—	10	—	1·82	—
Ulcus Penis non Syphilitica	2	—	—	—	·14	—
Bubo simplex - -	9	—	2	—	·80	—
Gonorrhœa - -	5	—	1	—	·43	—
Orchitis - - -	1	—	3	—	·29	—
Phymosis - - -	—	—	—	—	—	—

6. The troops, both European and native, suffer but little from epidemic or endemic disease. A very severe outbreak of cholera amongst the native troops took place in October 1858; it had been unknown at the station for 10 years previous. This complaint at that particular time, and for some months afterwards, committed great ravages amongst the population on both sides of the Red Sea; it lasted among the troops only for a week.

The following Tables show the total admissions and deaths among the European and native troops for the years ending 31st March 1858 and 1859:—

European Troops.

Diseases.	Admissions for Two Years to Total of Admissions.	Deaths to Total Deaths.	1858. Strength, 297. Total Admissions.	1858. Strength, 297. Total Deaths.	1858. Strength, 297. Per-centage of Deaths.	1859. Strength, 356. Total Admissions.	1859. Strength, 356. Total Deaths.	1859. Strength, 356. Per-centage of Deaths.
Fevers - -	—	—	51	1	1·9	339	3	0·8
Dysentery - -	3·24	33·33	1	—	—	26	6	23·
Cholera - -	·12	—	—	—	—	2	—	—
Small-pox - -	—	—	—	—	—	—	—	—
Rheumatism -	1·91	—	8	—	—	8	—	—

Native Troops.

Diseases.	Admissions for Two Years to Total of Admissions.	Deaths to Total Deaths.	1858. Strength, 1,094. Total Admissions.	1858. Strength, 1,094. Total Deaths.	1858. Strength, 1,094. Per-centage of Deaths.	1859. Strength, 1,175. Total Admissions.	1859. Strength, 1,175. Total Deaths.	1859. Strength, 1,175. Per-centage of Deaths.
Fevers - -	—	—	191	3	1·5	194	3	
Dysentery - -	4·60	1·02	20	—	—	43	1	2·3
Cholera - -	9·97	77·55	1	—	—	123	96	61·7
Small-pox - -	·07	—	1	—	—	—	—	—
Rheumatism -	·07	—	61	—	—	—	—	—
Scorbutus - -	6·72	4·07	22	2	9·0	70	2	2·8

Tables of Admissions and Deaths from Fevers for the past Two Years, with the Per-centage of Admissions and Deaths on Total Admissions and Deaths for the same Period.

European Troops.

Diseases.	1858. Strength, 297. Total Admissions.	1858. Strength, 297. Total Deaths.	1859. Strength, 356. Total Admissions.	1859. Strength, 356. Total Deaths.	1859. Strength, 356. Admissions on Total Admissions.	1859. Strength, 356. Deaths on Total Deaths.
Febris ephemera - -	—	—	13	—	1·56	—
„ intermittens -	10	1	77	—	10·48	5·55
„ remittens - -	—	—	5	—	·60	—
„ continua co. -	40	—	242	3	33·91	16·66

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References to Subjects and Queries.	Replies.

IV. Health of the Troops —*Diseases—cont.*

NATIVE TROOPS.

Diseases.	1858. Strength, 1,094. Total Admissions.	1858. Strength, 1,094. Total Deaths.	1859. Strength, 1,175. Total Admissions.	1859. Strength, 1,175. Total Deaths.	1859. Strength, 1,175. Admissions on Total Admissions.	1859. Strength, 1,175. Deaths on Total Deaths.
Febris ephemera -	91	—	82	—	12·65	—
„ intermittens -	93	2	109	2	14·76	4·08
„ remittens -	—	—	—	—	—	—
„ continua co. -	4	1	—	1	·36	2·04

7. None of the diseases enumerated in the four orders of the zymotic class show any marked change in their nosological character from what is exhibited in other places. Fevers, diarrhœa, and dysentery are most prevalent in September, and rheumatism in the cold weather. Small-pox prevails at all seasons. No particular climatic or atmospheric conditions precede or accompany their appearance. In the bazaars disease is most prevalent, but great attention is paid to the cleanliness, ventilation, and, as far as possible, the overcrowding of the dwellings is prevented. The personal habits of the troops do not predispose to these diseases, but the predisposition to them among the native population cannot be entirely removed.
8. A soldier's duties and occupations in barracks do not influence the prevalence of disease.
9. In a station such as Aden, prophylactic doses of quinine are not required.
10. For the prevention of epidemic diseases in Aden great attention is paid to cleanliness, as well as the establishment of a native village outside the fortifications, and certain quarantine regulations; but in a migratory population like this, it is impossible to prevent the ingress of persons affected with small-pox and such like diseases.

V. INTEMPERANCE.

1. The soldiers at the station are temperate; there are no confirmed drunkards.
2. There have been no admissions into hospital from diseases directly or indirectly caused by intemperance. In the royal artillery, during the half year ending 31st March 1860, the following entries have been made in the defaulters' book:—

Regimental entry - - - -	1
Battery „ - - -	12

Of these, the regimental entry and five of the battery ones were for acts of simple drunkenness, the remainder were for very slight offences. There has been one court-martial at the station since the battery first arrived at Aden in October 1858, and that was for being drunk and fighting; the man had just joined the battery. There is no record kept of abstainers, and men are often prevented joining such a thing on account of its getting known. The men who have been invalided from or died at this station have mostly arrived here with weakened constitutions. Drunkenness is always punished as an offence.
3. Arrack is sold at the canteen and bazaar, and in the latter place other descriptions of spirits also. Twenty-four parts of water are mixed with 76 of arrack. Each man consumes about three-quarters of a dram daily. Spirit, although issued by the commissariat, is paid for by the men; it forms no part of the ration at the station, on march, or in the field. The men do not take a dram before morning parade. Spirit is never given as a ration to convalescents. No drinks injurious to health, other than intoxicating drinks, are sold at the canteens; but most probably they are in the bazaar.
4. Spirits may be taken in moderation without obvious mischief; convalescents never require any, but are given beer and wine by prescription. The limited amount of spirit allowed at the canteens cannot affect the efficiency or the internal discipline of the regiment.
5. The quality of arrack allowed from the canteen cannot be injurious to health, but that sold in the bazaar is very indifferent and decidedly injurious; to abolish the sale of spirits in the bazaar would be, consequently, advantageous.
6. Malt liquor in moderation is conducive to health in this country, and it is not often the soldiers suffer from its abuse.
7. Tea is drunk at the morning and evening meals. Good lemonade and soda water are very expensive; but ginger beer is cheap, and consequently a good deal drunk. Their influence on health, efficiency, and discipline is beneficial, and far better than intoxicating drink.
8. It would not be beneficial to suppress the spirit ration, and to substitute for it beer, tea, &c., because then the soldier would purchase an inferior article in the bazaar.
9, 10. It would not be beneficial to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, tea, coffee, &c., to be sold to the troops. No recommendations to suggest on these points.
11. The canteen and bazaar rules are those laid down in Jameson's code, and they are properly obeyed. The canteen is under the management of a committee, and is provided with all necessaries. No spirits, wine, or beer are allowed to be sold to a native, nor are any of those articles allowed to be taken away from the canteen, except under special authority. The canteen is accessible to the men from daybreak to tattoo beating, but is open for the issue of liquors only during such periods of the day as may be ordered by the Commander-in-Chief. The men must drink their arrack on all occasions at the place of issue, but they may take away the mid-day issue of malt for consumption with their dinner. No spirits are issued on any occasion before the usual dinner hour. Not more than one dram of arrack or one quart of malt liquor is issued at one time. Men on guard and recruits who have not finished their drill are not

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	allowed spirits. No intoxicated person or man under punishment is allowed to enter the canteen. In the bazaars no spirit is allowed to be made or vended without special permission, under a penalty of 50 rupees for the first offence, or one month's imprisonment, and for each subsequent offence the punishment of 24 lashes, or a fine of 100 rupees. No spirituous liquors are allowed to be sold to any European soldier or woman belonging to the detachment, or to any one for their use, within the limits of the cantonment.
VI. Diet.	1. The composition of a soldier's ration is as follows:—1 lb. beef or mutton, or both, in the proportion of five to two; bread, 1 lb.; vegetables, 1 lb. (but no potatoes), composed of onions, sweet potatoes, brinjalls, and bheudy; rice, 4 oz.; salt, 1 oz.; black or green tea, $\frac{5}{7}$ oz., in the proportion of two to one; sugar, 2 oz.; sweet water, 3 gallons; and brackish water, 2 gallons. No change in the diet, except that of providing potatoes. A responsible inspection of the ration is made daily by the orderly officer and quarter master. 2. A complete ration, including vegetables, is provided; but the vegetables are not good, and the beef is inferior. A soldier takes three meals a day, viz., breakfast at 8 a.m., dinner at 1 p.m., and supper at half-past 4 p.m. The proportion of vegetables entering into the constitution of the ration is $\frac{1}{3}$th dry onions, $\frac{1}{8}$th green onions, $\frac{1}{8}$th white radishes, $\frac{1}{10}$th bheudies, $\frac{1}{8}$th pumpkin, and $\frac{1}{10}$th sweet potatoes. 3. We would strongly recommend that potatoes be imported from Bombay, and issued to the European troops, the same as is now done to native troops. The Europeans do not dispose of their rations. 4. The means and apparatus available for cooking at the station are one set of copper utensils, which are tinned once a month, to every 10 men. They consist of one cooking kettle and cover, which answers as a frying-pan, and a large meat dish. The kitchens are kept clean. The water supply is from the men's allowance of three gallons sweet and two gallons brackish water per man. About three-quarters of the meat is boiled, and one quarter fried. There are no means for roasting. The cooking is generally properly done. Sometimes the meat is cooked up with the vegetables into a soup; at others, stewed; and occasionally made into pies. Tea is properly prepared morning and evening. The great want is the potato. On the march, one pint of coffee per man is issued at the half-way halting place, one cook per company being sent on overnight to prepare it. 5. Soldiers' gardens could not be established at Aden, or near it.
VII. Dress, Accoutrements, and Duties.	1. A soldier's dress and accoutrements consist of cloth tunic, cloth trousers, helmets, regulation accoutrements, serge tunics, trousers, and helmet, khakee tunics, khakee trousers, helmet, or forage cap, a forage cap with white covers according to the season. The dress and accoutrements are suitable to the climate; the Khakee clothing especially, both by day and night in the hot weather, and serge tunics and cloth trousers by night only in the cold season. There are no improvements to suggest in the dress worn at this station. In the hot weather the guard dress is Khakee; in the cold, serge tunics and cloth trousers. The men on guard are protected from sun and wet by means of sheds or verandahs.
Duties.	1. It would decidedly be advisable that all men should be drilled at home before being sent to India. 2. At Aden there are very few parades in the hot weather. Duration of drill varies according to taste of commanding officers; but half an hour is quite sufficient. The men do not suffer in health from drill. The best time for drills, parades, or marches is either early in the morning, or late in the evening. With regard to the number of nights the men have in bed during the week, the 4th Queen's have 11 nights in bed in camp, and 3½ nights at Isthmus. The royal artillery have 4 nights in bed. 3. Guards are mounted in the immediate vicinity of the barracks, and last 12 hours by day and 12 hours by night. There are roll calls morning, noon, and evening, when there are no parades. No ill effects arise from night guards, and no additional precautions are required.
VIII. Instruction and Recreation.	1. The means of instruction and recreation at the station are as follow:—There is one ball court, two skittle grounds, two schools, with good schoolmasters, one for European and one for native regiments, and a library and reading-room sufficiently lighted at night. There are no day-rooms or soldiers' clubs, or soldiers' gardens, neither are there any workshops, theatre, or gymnasia. The means are sufficient to keep the soldiers occupied during the wet season and the heat of the day; but the men will be better off in this respect when the whole of the barracks and buildings which have been sanctioned are completed. Europeans are not allowed out during the heat of the day. 2. To improve the existing means of recreation more skittle grounds, with sheds, should be provided; also workshops, supplied with tools, and a theatre. 3. Soldiers' savings' banks have been already instituted; many men, however, remit their money to their friends. 4. There are no trees to shelter the men during the day; the men, however, can take exercise in the hot weather in the verandah of their barracks, but the addition of a gymnasium, under cover, would prove beneficial.
IX. Military Prisons.	1. There are four cells under one roof, in an open situation on the spur of a hill. There are also two cells attached to the quarter guard of the infantry regiment, Front Bay; their ventilation and sanitary state is good. Other cells are sanctioned, and will be built in due course.
X. Field Service.	1. There are no local regulations for field medical service, not included in the general presidency regulations. 2. Medical officers are always consulted as regards the conduct of the line of march of troops, bivouacking, camping, &c., and with the greatest benefit. 3, 4. Troops are never encamped out except on an emergency. Rules and regulations for field hospitals, &c. are sent. *See* Appendix.

ADEN.
BOMBAY.

References to Subjects and Queries.	REPLIES.
XI. STATISTICS OF SICKNESS AND MORTALITY.	The following Table gives the statistics of sickness and mortality at the station :—

EUROPEAN TROOPS.

Years.	Corps.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1850–51	Wing H.M.'s 78th Highlanders.	501	184	4	—	—	7	3	81	4	67	1	7	3	—	—	263	1	609	16	121·5	3·1
1851–52	Ditto ditto.	483	89	1	—	—	14	2	22	—	147	1	10	—	—	—	193	2	475	6	98·3	1·2
1852–53	Ditto ditto.	400	87	2	—	—	43	—	29	1	123	1	6	—	—	—	229	3	517	7	129·2	1·7
1855–56	Ditto 86th Regiment.	458	174	1	—	—	53	2	32	1	157	—	13	1	—	—	270	1	699	6	152·6	1·3
1856–57	Ditto ditto.	456	58	1	—	—	106	—	25	—	101	—	13	—	—	—	244	—	547	1	119·9	0·2
1857–58	Ditto 57th ditto. Ditto 86th ditto.	286	53	—	—	—	14	1	3	—	35	—	2	—	—	—	91	—	198	1	69·2	0·3
1858–59	2/11 Royal Artillery - Wing H.M.'s 57th Regiment.	311	261	2	—	—	19	2	10	1	53	2	3	1	—	—	141	1	487	9	156·6	2·9
1859–60	5/13 Royal Artillery - Wing H.M.'s 4th O. Regt. Ditto 57th ditto.	322	67	1	—	—	12	—	10	—	54	—	9	—	—	—	203	—	35	1	110·2	0·3
	European Troops in the Indian Army.																					
1852–53	Head Quarters 1st Bombay European Regt. Fusiliers.	132	46	—	—	—	10	—	9	—	23	—	19	—	—	—	177	—	284	—	215·1	—
1853–54	Ditto ditto.	513	218	1	—	—	34	—	47	1	131	3	75	3	—	—	450	—	955	8	186·1	·5
1854–55	2nd Company 1st Battalion Artillery. Head Quarters 1st Bombay European Regt. Fusiliers.	516	133	2	—	—	38	3	49	2	122	—	72	2	—	—	527	4	941	13	182·3	2·3
1855–56	2nd Company 1st Battalion Artillery. Head Quarters 1st Bombay European Regt. Fusiliers.	178	64	1	—	—	12	—	7	2	65	3	17	1	—	—	127	1	292	8	164·0	4·5
1856–57	2nd Company 1st Battalion Artillery.	102	23	—	—	—	30	—	1	—	44	—	5	—	—	—	63	1	166	1	162·7	0·9
1857–58	Ditto ditto.	94	10	1	—	—	2	—	—	—	11	—	5	—	—	—	46	2	74	3	78·7	3·2
1858–59	Ditto ditto.	42	3	—	—	—	—	—	1	—	5	—	4	—	—	—	31	—	44	—	104·7	—

NATIVE TROOPS.

1853–54	Detachment Sappers and Miners.	108	15	—	—	—	6	—	—	—	11	—	1	—	—	—	59	2	92	2	85·1	1·8
1854–55	5th Company 3rd Battalion Artillery. Detachment Sappers and Miners. 18th Regiment Native Infantry.	308	42	2	—	—	7	2	1	—	20	1	2	—	—	—	140	3	212	8	68·	2·5
1855–56	5th Company 3rd Battalion Artillery. Detachment Sappers and Miners. 18th Regiment Native Infantry.	1,195	308	4	1	—	54	1	6	—	227	3	17	—	—	—	774	10	1,387	18	116·0	1·5
1856–57	5th Company 3rd Battalion Artillery. Detachment Sappers and Miners. 18th Regiment Native Infantry.	1,017	330	2	1	—	45	3	5	1	103	1	14	—	—	—	603	4	1,101	11	108·2	1·0
1857–58	5th Company 3rd Battalion Artillery. 6th Company 3rd Battalion Artillery. Sappers and Miners - 29th Regiment Native Infantry.	1,094	191	3	5	—	31	—	3	1	62	1	7	—	—	—	308	3	607	8	55·4	0·7
1858–59	6th Company 3rd Battalion Artillery. 2nd Company Sappers and Miners. 29th Regiment Native Infantry.	1,175	233	3	2	—	45	3	—	—	156	4	24	—	123	76	562	4	1,145	90	97·4	7·6
1859–60	6th Company 3rd Battalion Artillery. 2nd Company Sappers and Miners. 29th Regiment Native Infantry.	1,114	229	2	1	—	23	1	3	1	118	1	18	—	1	—	229	5	622	10	55·8	0·9

By order of the Acting Principal Inspector-General, Medical Department,

W. C. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 9th November 1860.

WOMEN AND CHILDREN.

Years.	Corps.	WOMEN. Strength. Europeans.	Indo-Europeans and Natives.	Total.	Treated. Europeans.	Indo-Europeans and Natives.	Died. Europeans.	Indo-Europeans and Natives.	Ratio per Cent. to Strength. Treated.	Died.	CHILDREN. Strength. Europeans.	Indo-Europeans and Natives.	Total.	Treated. Europeans.	Indo-Europeans and Natives.	Died. Europeans.	Indo-Europeans and Natives.	Ratio per Cent. to Strength. Treated.	Died.
1855-56	Her Majesty's Right Wing 86th Regiment.	28	—	28	52	—	1	2	185·7	3·5	46	—	46	60	—	3	—	130·4	6·5
1856-57	Do. do. do.	27	—	27	34	—	—	—	125·9	—	41	—	41	65	—	5	—	160·9	12·2
1859-60	Her Majesty's 4th K. O. Regiment	6	—	6	—	—	—	—	—	—	12	—	12	—	—	—	—	—	—
1852-53	Head Quarters, 1st Bombay European Regiment.	28	22	50	49	40	1	—	178·0	6·0	41	20	61	44	16	6	—	98·3	9·8
1853-54	Do. do. do.	13	16	29	10	9	1	—	65·5	3·4	20	16	36	6	2	1	—	22·2	2·8
1854-55	2nd Company 1st Battalion Artillery	9	3	12	1	1	—	—	16·6	—	12	1	13	1	—	—	—	7·7	—
„ „	Head Quarters, 1st Bombay European Regiment.	15	14	29	18	13	—	—	106·9	—	26	16	42	29	13	3	3	100·0	14·3
1855-56	2nd Company 1st Battalion Artillery	8	3	11	8	—	—	—	72·7	—	12	—	12	2	—	—	—	16·6	—
1856-57	Do. do. do.	6	3	9	14	2	—	—	177·7	—	11	2	13	31	3	2	—	261·5	15·4
1857-58	Do. do. do.	4	3	7	5	4	—	—	128·5	—	11	3	14	11	4	2	1	107·1	21·4

By order of the Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department, Bombay, 30th January 1861.

W. C. COLES, Assistant Surgeon, Secretary.

References to Subjects and Queries.	Replies.
XII. HOSPITALS.	1. Ground plans of the hospital are transmitted. 2. The hospital of the infantry in Front Bay is separated from the barracks by a wide watercourse. The position of buildings for an hospital for artillery is quite away from the barracks and on the sea shore, in a slightly elevated position; it is also quite away from the bazaar and town. Nothing interferes with the free ventilation of these buildings, and the site in every respect is quite healthy. 3. The water supply of the hospital, which is from wells, is principally brackish, and there are but few sweet wells in Aden. Tanks in the Taweela Valley, now under construction, will be finished in about 18 months, and will contain between 10 and 12 million gallons of rain water. A condenser is erected at the Isthmus, capable of supplying 5,000 gallons a day, and two small ones, at Steamer Point, capable of supplying between them 3,000 gallons per diem at present. Extra boilers and condensers are, however, to be added. 4. There is no drainage. The refuse water from the hospital is absorbed by the soil. 5. The wards in the hospital for infantry are on the ground floor, and three feet above the surrounding ground. In the artillery hospital the wards are four feet above the ground. The floors are filled in with dry rubble, and paved with cut stone. There is no perflation of air under the floor. The roof water sinks into the subsoil. There is no drainage or guttering round the hospital, it not being necessary, as the rain-fall is exceedingly limited. The foundation plinth of the hospital for infantry is constructed of rubble and chunam masonry. The walls are of wattle and daub, and the roof is covered with jawlies. The doors, windows, and ventilators are of teak. The foundation and plinth of the walls of the artillery hospital are of rubble and chunam masonry; the roof covering is of jawlies; and doors, windows, and ventilators are of teak. The walls and roof are single, but sufficiently thick to keep the hospital cool. The hospitals are supplied with verandahs on both sides, which are used for the accommodation of the sick when the hospital becomes crowded. The buildings consist of one flat. Table of Hospital Accommodation. Date of construction:—Infantry hospital, Front Bay, 1857-8; Artillery ditto, 1860. Total number of wards, 4; European General Hospital at Point unknown. Total regulation number of beds, 54.

Wards.	No.	Regulation No. of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. Number.	Height.	Width.
									Ft. in.			
Royal Artillery Hospital - -	1	12	36	24	$\frac{20+32}{2}=26$	22,464	1872·	72·	1 6	6	6	4
European Infantry in Front Bay -	1	12	36	24	$\frac{17+26}{2}=21\frac{1}{2}$	18,576	1548·	72·	1 6	7	6	4
The European General Hospital at Steamer Point - -	1	20	50	22	$\frac{13+22}{2}=17\frac{1}{2}$	19,250	962·5	55·	1 6	10	$4\frac{1}{2}$	3
	1	10	40	15	$\frac{12+18}{2}=15$	9,000	900·	90·	1 6	11	$4\frac{1}{2}$	3
Temporary Hospital. Native Infantry Sappers and Miners, and Golundauze Hospital - -	1	6	21	11	$\frac{7+15}{2}=11$	2,541	423·5	38·5	1 6	1	4′ 6″	2′ 6″ and one door $6\frac{1}{2}\times 4$.
	1	20	49	21	11	11,319	565·95	51·45	1 6	3	4′ 6″	2′ 6″ and one door $6\frac{1}{2}\times 4$.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*.	The hospital is so placed as to receive the full benefit of the prevailing winds. The windows open outwards, and their arrangement and construction is conducive to ventilation. 6. The means of ventilation are teak wood trellis work in the walls over each door and window, and an open ventilator in the roof. The means are sufficient to keep the wards at all times free from odour and closeness. There are no jalousies or jhilmils. 7. The air of the wards is cooled by punkahs. 8. No means of warming are necessary. The walls of the wards are cleansed and lime-washed about once every quarter. 9. The privies and urinals are about 40 or 50 feet off from the hospital. They are drained by hand, and are not offensive. There are no cesspits. 10, 11. There is a bath-room attached to the hospital for lavatory purposes, and for bathing the sick. It is sufficient for the purpose, and convenient. 12. The hospital linen is washed and dried by washermen. The means are amply sufficient for the purpose. 13. The storage is sufficient and dry. 14. The bedsteads used in hospital are planks on iron trestles, the same as used in barracks. 15. The kitchen is about 30 or 40 feet from the hospital. The cooking apparatus is the same as that used in barracks already described. The means are sufficient, and the cooking of diets is properly done and varied as much as possible. Potatoes are recommended. 16. As one system of diet tables and diet rolls exists under the Bombay presidency, and the returns required for working the internal economy of the hospital, and the present forms in use for keeping statistics of mortality and invaliding are the same in all corps, varying only regarding natives and Europeans, this question will have been fully answered in the report from the presidency. 17. With regard to attendance on the sick, there is an European hospital serjeant, but no nurses. Native ward coolies to attend on the sick are in constant attendance. 18. The sanitary state of the European hospitals is good. No epidemic disease has prevailed for the last two years, neither has gangrene nor pycemia appeared. 19. There are no deficiencies or sanitary defects to notice, nor any improvements to suggest. 20. There is no special provision made for convalescents taking exercise. 21. Soldiers' sick wives and children are treated by the medical officers of the regiment. There is at present no hospital in camp especially set apart for them; but a sanitarium for females exists at Steamer Point. A female hospital is required in camp. 22. There are no special local hospital regulations which are not included in the general presidency medical regulations. 23. The medical officer's opinion is generally attended to in all matters relating to the hospitals. He has full control as to medical comforts. 24. There is no convalescent hospital at the station, nor is one required.
XIII. Burial of the Dead.	1. The burial ground of British troops is in a direct line to the sea breeze at all seasons. 2. Its soil is gravelly. Drainage is not necessary. Cannot say whether decomposition takes place readily. The ground is carefully kept. The camp burial ground contains 74,240 square feet, the old cemetery at Steamer Point 27,000 square feet, and the new one, at the same place, 28,350 square feet. 3. The graves are seven feet long and four feet wide, with a three feet interval between each grave. The depth for an adult is six feet, and for a child five feet. Graves are only re-opened to admit the remains of relations; two or three of the same family may be interred in one grave, but seldom more. Interment is compulsory at ordinary times within 12 hours after death, and during epidemics as early as possible. The Europeans, Jews, and Mahomedans are the only nations who bury their dead, and they bury them in fresh graves about five feet deep. 4. The grave yards are never offensive. British troops are buried in the early morning or cool of the evening, according to the hour of death. 5. Camp followers or bazaar people are buried according to caste. Mussulmen and Jews bury their dead. Hindoos and Maharattas dispose of them by cremation. 6, 7. No injury to the public health accrues from the present practice. No improvements are suggested.

(Signed) E. P. Lynch, Major, Commanding at Aden.
Robert H. Davidson, Surgeon Superintendent Medical Department, Aden.
John A. Fuller, Captain Executive Engineer.

17th July 1860.

APPENDIX TO REPORT ON ADEN.

Field General Hospital Regulations.

1. Whenever it may become necessary, in consequence of the increased number of sick and wounded men, during war or distant campaigns, to have recourse to field general hospitals in fixed situations, one or more such hospitals are to be established accordingly upon the general principles in regard to supplies of medicines, diet, and necessaries prescribed for regimental hospitals.

2. As soon as the officer commanding the troops shall have determined, in communication with the superintending surgeon, on the place at which a field hospital is to be established, and the number of patients to be transferred to it from the regimental hospitals in camp, or for whom it might be advisable to prepare hospital accommodation and necessaries, instructions are to be forthwith issued to the commissariat for the immediate preparation and supply of all articles, including cots for the sick and wounded, with the requisite establishment of hospital servants furnished by that department, according to statements to be prepared by the superintending surgeon, and sanctioned by the officer commanding the troops.

3. As the hospital establishments of European regi-

ments, of which the sick and wounded are sent to field hospitals, may admit of being for a time diminished, as many servants and as much clothing and bedding shall accompany sick and wounded men sent from these hospitals as can, in the judgment of the superintending surgeon, be spared, with reference to the present exigencies or prospective wants of such regimental hospitals.

4. The commander-in-chief, when with the army, will, in the same orders which direct the formation of one or more field hospitals, authorize the provision by the proper departments of all articles necessary for the purpose, and the entertaining of the requisite establishments. When the commander-in-chief is not present with the army, or a division of it, the officer commanding will issue orders to the above effect under discretional authority to be previously consigned to him.

5. Medicine indents are to be prepared by the surgeon or medical staff officer, who may be selected for the charge of a field hospital, under the instructions of the superintending surgeon, by whom they are to be countersigned, for such supplies of those articles as may be deemed necessary and can be spared from stores in camp in the first instance; further supplies can be drawn from the stationary depôts; or the indents shall be made on the stationary depôts, in the event of its being practicable, in consequence of previous arrangement, for the first demands, to be thence supplied in proper time.

6. Whenever the probable time and place at which it may become necessary to establish one or more general hospitals, for the reception of the sick and wounded during war, can be anticipated by the commander-in-chief, or the officer commanding the troops, the earliest intimation will be given to the commissariat and the nearest medical depôt, in order that the attention of officers in charge of those departments may be directed to the probable demands that will be made upon them, or according to the nature and probable duration of the service in prospect. Adequate supplies for one or more general hospitals will accompany the army in the first instance, or be intermediately brought forward to such advanced situation as may be found convenient.

7. The expense that may be incurred in furnishing petty stores, necessaries, &c. by the hospital storekeeper is to be charged in a contingent bill monthly, liable to be attested upon oath when required. These bills are to be countersigned by the surgeon or senior medical staff officer in charge of the hospitals in which the articles charged for shall have been expended (or for which they may have been provided in the case of any remaining on hand at the end of each month), and also by the superintending surgeon of the division, in testimony of their correctness, to the best of the knowledge and belief of these officers; statements in the form of indents, which are to be signed by the surgeon of the hospital, setting forth the several articles which have been required from time to time, for the use of the sick and wounded (?).

An advance of cash will be made on this account in the first instance, on the application of the surgeon or medical staff officer who may be appointed to the charge of the hospital, to be made through the superintending surgeon; and a sum equal to the amount required for the monthly disbursements is to be advanced by the paymaster or the collector, where there may be no pay-office at hand, upon timely application being made by the hospital storekeeper through the surgeon in charge of the hospital. The amount to be adjusted as usual in other cases of money being advanced by collectors on account of military disbursements.

9. A medical staff, consisting of a surgeon for the general charge and superintendence of the field general hospital, with a salary of Bombay rupees 600 per month, exclusive of the usual pay, batta, and tent allowance of his rank, with as many surgeons or assistant-surgeons for the duties thereof as may be necessary and can be spared, together with an assistant-surgeon for the appointment of hospital storekeeper to the general hospital, will be appointed by the commander-in-chief, to whom a list of those most available shall be submitted by the medical board or by the superintending surgeon, if those appointments be made immediately in the field, care being taken in all such cases not to remove from the charge or duties of regimental hospitals either the surgeon or assistants, to the prejudice of the management and requisite duties of those hospitals respectively; and to provide for this eventual arrangement and other calls for medical aid during war a sufficient medical staff will always be appointed in the first instance, when practicable, to do duty with every considerable division of the army that may be ordered to take the field.

10. The assistant surgeon who may be appointed to act as hospital storekeeper to general hospitals shall invariably, in addition to that charge, afford such personal medical attendance to the sick as may be required of him by the surgeon in charge of the hospital.

11. An officer or other agent of the commissariat department will attend every field general hospital that may be thus established during war, as well for the purpose of furnishing and maintaining the requisite hospital equipments and diet for the sick, as for supplying provisions to the men who may be discharged from the hospital fit for duty until they shall rejoin their corps.

12. An apothecary and steward, with such other first-class servants as may be necessary, are to be appointed, on the recommendation of the superintending surgeon, to each field general hospital that may be established during war, and such a number of second-class servants as he may deem proper shall be drawn from the commissariat for the same purpose.

13. The establishments that may be allowed for field general hospitals, as well as the establishments fixed for medical depôts in the field, are to be mustered on the 1st of each month by superintending surgeons, or the commanding officer on the spot, or officers properly authorized, as the case may be; and regular muster rolls are to be prepared for all those establishments, and to be attested in the usual manner by the mustering officer whoever he may be.

14. The pay of hospital servants employed in field general hospitals is to be drawn from the commissariat, and paid according to the rules prescribed on this subject for regimental hospitals.

15. An officer from each corps is always to be sent in charge of the sick, when they amount to 20 men, who may be sent from regiments or corps of Europeans, to field general hospitals, and a sufficient number shall remain on that duty until it may be necessary to accompany the men when ordered to rejoin their corps.

16. Whenever men may be discharged from field general hospitals as no longer requiring medical attendance, yet in the opinion of the surgeon requiring some modification of their ordinary diet, rations of provisions, if Europeans, will be supplied to them by the commissariat, or a provision roll framed on this principle, to be presented daily by the commissioned or non-commissioned officers under whose charge they may be placed, and the provisions to be thus supplied may be made to vary from articles usually issued to troops in health, according to the state of convalescence of men thus circumstanced, and for whom certificates are to be furnished by the medical staff who may have attended them in the field general hospital, describing the diet, &c., most proper for the men whilst in progress to their corps, according to which the provision rolls are to be countersigned by the officer in charge of the men, and delivered as vouchers to the commissariat department, stoppages being made from the men on this account, agreeably to the regulations on this subject, when rations or messes are furnished for men not in hospital or under such further regulations as circumstances may render expedient.

17. The regulations respecting hospital stoppages from Europeans, as detailed in Section V., are applicable to and are to be particularly attended to by medical officers in charge of field general hospitals; and when they are discharged from them, they are, as in regimental hospitals, to be furnished by them with the regular certificates.

Arrangements in the Field before and after Action.

18. When the force to which a medical officer is attached is placed under circumstances rendering it likely that in the course of service it may be engaged with an enemy, the medical officer will arrange with the adjutant or staff officer of his charge for the attendance at the hospital or his own quarters of the bandmen, to the end that they may be by him instructed in the application of field tourniquets.

19. He will explain to them their use, mode of application, &c., and will satisfy himself that they are in so much fitted for the duties they may soon be employed in.

20. While the troops are moving on, medical officers will follow their respective corps with all the empty sick carriage, &c.; but as soon as they deploy, or form for action, all, excepting one medical officer for each brigade or body of equal strength, will move to a short

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distance in the rear, out of the range of musketry, and will there make their preparations for succouring the wounded and performing any operations that may then be necessary. Cordials, &c., should be at hand, and all instruments and dressings, &c., ready to be used.

21. In the rear of each brigade, and within range of musketry, one medical officer (in general, an assistant surgeon, and the junior present) will, as above stated, be stationed for the purpose of checking any alarming hemorrhage, and expediting the removal of wounded men to the stations in the rear.

22. For this purpose the doolies and other sick carriage will be placed under his orders, and the bandmen and others will assist the wounded from the ranks to the place where the medical officer is stationed, and from thence into the doolies.

23. To all of the bandmen and others employed in this duty field tourniquets should, previous to the action, have been issued. No men are to be allowed to go into doolies who can possibly walk to the rear.

24. The surgeons or medical officers of regiments are, as has been stated, to be stationed at a short distance in the rear, but out of the range of musketry, and there the wounded will be dressed, and all cases requiring immediate operation be attended to; at these posts bheesties with water will be placed, and from thence all men sent to field general hospitals will be despatched.

25. These posts are to be in as sheltered situations as possible, and if not very easily seen, to be distinguished by some flag or other conspicuous object.

26. If any town or village be situated in the rear, not far from the scene of action, in which there are houses or buildings calculated to receive wounded men, straw, &c., for bedding and abundance of water, &c., should be provided and kept in readiness for them, and to this at least all those severely wounded ought to be removed.

Removing Sick or Wounded to the rear or to Field General Hospitals.

27. The quantity of carriage rendered disposable by the consumption of stores of every kind is invariably to be notified to the superintending surgeon or medical officer performing his duty with the force, or in their absence, to the medical officers with corps, to the end that it may be taken advantage of in the transport of sick or weakly men; and in the same manner, when carriage so rendered disposable is sent to the rear, it ought to be employed in the conveyance of men to field general hospital.

28. By taking advantage of these opportunities the force can be easily disencumbered of its chronic cases.

29. To enable superintending surgeons and medical officers to perform this part of their duty without inconvenience, the place of destination, with notice of the exact day and hour when such carriage is to proceed to the rear, ought to be intimated to medical officers.

30. In addition to those means of moving sick to the rear, or at times when these do not exist, advantage must be taken, first, of the doolies and sick carriage belonging to their charge; second, of transport belonging to the country.

31. When it can possibly be avoided, the first ought never to be detached, unless for short distances, or excepting when stores of some description, such as medicines, instruments, &c., are to be brought up from the rear; and in both these cases the most positive directions should be given for its immediate return.

32. The transport of the country should be divided into classes, as doolies, cots, &c., for those unable to ride or go in carts, &c.; and carts, bullocks, tattoos, &c., for the slighter cases.

33. Medical officers must always, in person, class off their sick, and apportion the different modes of conveyance for individuals.

34. When water carriage is to be had, it is incumbent on medical officers to ascertain whether the boats are decked, open, or capable of being protected by awnings, and the cases should be allotted to them according to their condition.

35. Regimental surgeons should be directed to take advantage of every opportunity which offers for sending to the rear their chronic cases; acute cases should be kept as long as possible with their regiments, or at least so long as there remain any symptoms to subdue.

36. No case should be sent to the rear for reception into field general hospitals which can be conveniently treated in the regimental hospital with the probability of the soldier soon being made effective.

37. All convoys of sick sent to the rear should, according to their magnitude and the importance of the cases sent, be accompanied either by a medical officer or subordinate medical servant.

38. They ought to move at proper hours and by such routes as may have been laid down for them.

39. Care should be taken that every sick soldier sent to the rear have his blanket, watch cloak, warm clothing, and knapsack with him.

40. In case a subordinate medical servant only be attached to the convoy, he is to report himself to any medical officer that may pass him on the march, and, in any case of difficulty, is to request the assistance and advice of any medical officer who may be within reach.

41. The medical officer into whose charge the subordinate medical servant will deliver the men is to report the state in which they were received, with any casualties that may have occurred on the way.

42. During any halt of the convoy, the clothes and bandages, &c. of the men ought to be well washed and aired, &c., and the persons of the men themselves should be made as clean as circumstances will permit.

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Accommodation. Native Troops { Cavalry, 2,400. Infantry, 1,600.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The surrounding country is a desert, and is flat, sandy, and dry; there is no wood, jungle or water in the vicinity. 2. The elevation of the station is about 220 feet above the level of the sea, but it is on the same level as the adjacent country. There is no higher or healthier ground adjoining the station. 3. The nearest mountain is 60 miles distant and about 3,500 feet above the plain. 4. There are several small canals, bringing Indus water from a distance of 52 miles, which pass through or near the station; the vicinity is not, however, liable to overflow. There are artificial tanks made on purpose to retain the Indus water; but these have no prejudicial effect on health. 5. The station is perfectly open and freely ventilated; the temperature, however, is raised by the buildings being exposed to reflected sun heat. It is exposed to fresh dry cold winds in the winter months, and in the summer to fiery hot winds. 6. The surrounding country is cultivated in some parts during the autumn. All the cultivation is by irrigation, and is all round the station. Artificial irrigation has no effect on the health of the station. Fever prevails more or less in the end of autumn, when the Indus waters are drying up in the province generally. The prevailing winds then being S.S.E. or S.E., they pass over nearly 400 miles of swampy lands, and must necessarily come charged with malaria. Directly the northerly winds set in, in November, the fever disappears. There is no cultivation of rice. A little indigo was cultivated last year 2½ miles off; but no injury to public health occurred from it. 7. A large town, containing 10,000 inhabitants, immediately adjoins the station.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	8. The general nature of the soil of the district is alluvial deposit, brought down by the canals from the Indus, occasionally covered with a layer of drift sand from the desert, which lies along the north. The station occupies new ground.
	9. Water is found at a depth of 37 feet below the surface. In 1847 it was 45 feet; but from the larger quantity of Indus water brought down, and its freely percolating into the surrounding soil by means of the tanks, there has been a permanent rise of 8 feet. The wells are kept filled with Indus water during the time of its presence, which sweetens the soil by adding to the soaking supply. Wells, previously as salt as brine, have been made perfectly sweet this way.
	10. The rain-fall, which is very trifling, 8½ inches being the largest annual fall, rapidly evaporates or soaks into the ground. No drainage from higher ground passes into the subsoil of the station.
	11. The water-supply is derived from the Indus during the inundation months, and from wells at other times. There are two open tanks, one having a surface 62,600 square feet and a depth of 20 feet, the surface of the other being about 69,750 square feet and 7 feet deep. They are full from April to September. The shallow one is dry by December, the other holds a little water, when the Indus supply returns in April. The plants and animals they contain are the same as in all Indian tanks. No tank used for drinking purposes is also used for bathing, neither are the tanks or wells liable to pollution from any cause. No nuisance or malaria proceeds from any tanks within or without the station.
	12. There are the two tanks already mentioned and some 20 wells for the water-supply of the station. The Indus water, as it first comes up, is yellow and muddy from the silt in suspension, but on this being precipitated the water becomes clear, and is most delicious to drink. There are no means of giving its chemical composition; but it will be well known to chemists. The quality of the water is very good, and not injurious to health, and the amount is sufficient. It is raised either by hand in leather buckets, or by the Persian wheel. No better supply could be obtained.
	13. The climate is totally unfitted for Europeans.
	14. Hitherto stations have generally been selected more with an eye to their military importance than for their sanitary advantages. I am decidedly of opinion that all Europeans should be located as much as possible on hill stations, or at such healthy ones on the plains as can be selected to mass troops at. It is a waste of men's lives, scattering them over the country in bad climates, and where there are no means of giving them wholesome employment for mind or body during the summer months.
II. Climate.	1. The only instruments for conducting meteorological observations are the ordinary hospital thermometers.
	2. A meteorological table is prepared, but the information is very meagre, there being no instruments. The observations on rain are obtained from the political superintendent's register.

Table of Meteorological Observations, from 1st January 1848 to 31st December 1859, the year 1857 being omitted, the regiment having gone on service to Persia:—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Rain. Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January -	—	60	—	77	43½	Have only an Annual Record from 1851 upwards. The lowest fall of rain in one year was 2½ inches, the highest 8 inches.	N.E. & N.W.W.	Moderate commonly.	—	Cloudy, often light rain and showers. An earthquake in 1855 and thunderstorms. Wind variable, occasionally high.
February -	—	65	—	82	56		N.N.E., E., & S.	Variable, light, and moderate.	—	Showers and light rains for a few days, and an occasional dust storm.
March -	—	74	—	92½	48		E.N.E. to S.W.S.	Often high, with dust.	—	Dust storms; one or two very heavy. Light showers once or twice.
April -	—	85	—	100	70		N.W. to S.E.	Variable hot and dry winds.	—	Dust storms regularly, 7 in one month, 1851. Rain very little.
May -	—	95	—	107½	83		S. & S.E. most, occasionally N.W. to S.	—	—	Dust storms six days in 1851.
June -	—	99	—	108½	89½		S.E., variable and calms.	Simoon at times.	—	Calms and variable.
July -	—	97½	—	108	87		S.E.	—	—	Showers, occasionally heavy rain. Dust storms. 4 inches and upwards of rain fell in July 1855, 16 days.
August -	—	92½	—	102½	82½		S.W. & S.E.	Very light	—	Rain hardly noticeable generally; in 1856, 14 days' rain.
September	—	91	—	101½	80½		S.E. to E. & N.E.	Light -	—	Dews at night.
October -	—	80	—	93½	69		E. to N., S.E. to W.	Light -	—	35° of change of thermometer between morning and noon observed in 1849.
November	—	70	—	87½	52½		S.E. to E.N.E.	Variable	—	Cloudy often; dry weather as a general rule throughout the year.
December	—	62½	—	79	46		N.	Moderate	—	Ditto.

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. The climate, during the greater part of the year, is the driest in the world, the heat in summer being excessive, rendering the station totally unfit for European soldiers. The variation of temperature is sometimes very great. The cold winter months are most agreeable to Europeans, when ice and frost at night are common: this, however, lasts only for about three months, and during this period the natives of Hindoostan and the Deccan suffer much from chest complaints. Many thousands of trees have been planted in and around the station, and they sensibly diminish the heat in summer; but they have not had much effect in producing more or regular rain. On the canals drying up in the autumn, malaria is produced, and intermittent fevers prevail sometimes prostrating the majority of the troops and the inhabitants of the country. The wind at that time is generally from the S.S.E., and passes over some 350 miles of drying swamp; but the moment the northerly winds set in here, in November, the fever decreases rapidly. September and October are the most unhealthy months. The best precautions are wholesome generous diet, avoiding exposure to the sudden changes from heat to cold during the night, turning the troops out properly clad in the mornings. Drills and exercises should be much the same as at any other time during the year, guided by common sense, that is sufficient to keep the men's interest and attention alive, but not so much as to disgust or weary them; the latter will predispose to disease at any time. 4. There is no district more conducive to health nearer to the station than Kurrachee, the seaport of Scinde, which will be fully described by the authorities there. It is one of the best localities for European soldiers in India. 5. I have served for 18 years in Sinde, at the stations of Hyderabad and Jacobabad principally, 13 of which have been at the latter. Hyderabad is almost as cool as Kurrachee, being within the influence of the S.W. monsoon; but is often most unhealthy in the autumn and winter. I have served one year in the Punjab, at Peshawur, which was very unhealthy, as it is now. This might, I believe, be remedied by extensive planting of trees, the valley being almost surrounded by hills, and after rains noxious gases are evolved, which can neither escape nor be absorbed, the trees being very scarce.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Plans of the station, adjacent country, and barracks are forwarded. The large canals are on an average 10 feet deep and 20 feet broad; the smaller ones are 4 feet deep and 8 feet broad. There are no drains, sewers, dung-heaps, or cesspits. 4. Table of barrack accomodation. Date of construction of lines of - - { 1st Regiment, 1859. 2nd „ 1847. 3rd „ 1844. Total number of pendalls and non-commissioned officers' quarters, 21 double and 6 single pendalls; 87 N. O. quarters. Total regulation number of non-commissioned officers and men - 2,421.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
Pendalls -	100 men in each double pendall.	450	2 × 8	Average. 8′ 5″	61,200	6 12	72	1½		None.	
	50 in each single.	450	8	8′ 5″	30,600	612	72	1½		None.	
N. O. Quarters	One centre room.	18	11	10′ 0″	3,171	3,171	324	1½	6	2	Semi-circular.
	Two verandalls	18	7	9′ 5″							
Guard Room: Three quarter guards, each containing - -	2 rooms 30′	15		16½	—	—	—	—	7	2	—
	1 room 15′	16									

There are no windows, but doors to each man in front. There are no verandahs to pendalls; the soldiers sleep outside altogether in hot weather and within in the cold; there are no jalousies or jhilmils.

6. The men generally use the common charpoy of the country for sleeping on, which is an oblong framework with four legs, having coarse string stretched across it; they answer very well.
7. The men provide their own tents, which vary in form from the very humblest kind of rowtee for the sowar to a small single-poled tent for a native officer.
8. No particular means exist for the ventilation of the pendalls; no means are in use for cooling the air of barrack rooms.
9. The troops at this station live in what are termed pendalls, the foundation and plinth of which are built of burnt brick and mud, the walls of sun-dried brick and mud, and the roof of beams tatties, two mats, and rafters plastered with mud. On the rifle lines now in construction the roof is supported on light burnt brick arches.
10. Floors are usually constructed of earth, well rammed, raised one foot above the general level of the ground. In the hospitals the floor is paved with burnt brick. There is no passage of air beneath.
11. The materials and construction are suitable to the climate; and we are not aware that any improvement would increase the salubrity of the pendalls, &c. &c. Barracks and cantonments are kept in repair by the engineers' department; the commanding officer of the station being responsible for the general sanitary state. All buildings except the hospital are unwhitewashed.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	12. There are no lavatories for the men; they are not required for natives, as they perform their ablutions in the open air, with the aid of bheesties or water-carriers. 13. There are no cook-houses; each man making his own cooking arrangements. The dhobies or washermen wash and dry the clothes outside of camp, either at wells or water-courses. 14, 15. There are no privies or urinals. 16. No means of sewering or draining are required in the barracks, any water thrown about quickly disappearing by absorption or evaporation. There is no fluid refuse. No part of any building used as a barrack or hospital is damp. There are no foul ditches near the station. 17. Sweepers are employed to clear up all dirt or filth in the camp, which is then conveyed to one spot on the leeward side of the cantonment, and there burnt. This is done daily, and efficiently performed. The refuse from the horse lines is spread out over the road in camp. 18. Gardens are encouraged as much as possible in the cantonment. There are no old walls, thick hedges, &c., to interfere with the ventilation of the station or bazaar. 19. Drainage is unnecessary in the bazaar. The roads are broad, and a canal, full of water for seven or eight months, runs by it; wells are also close by. It is kept scrupulously clean, is planted with trees, and well lighted with oil lamps. Bazaar sweepers are employed to keep it clean, and offenders against regulations for preserving cleanliness are severely punished. The ordinary houses of the country are made of mud, or sun-dried or kiln-burnt bricks. No dunghills or cesspits are allowed within them for a moment. No nuisance is experienced in barracks from wind blowing over the native houses. 20. The slaughter places are at one side of the town, to leeward, about a mile from the barracks, and they are only allowed in one place. The offal is buried. No nuisance is experienced from them; if there were, those causing it would be punished under the local rules. 21. The owners of bazaar horses are allowed to keep them in their own places where they like, and are held responsible that no dirt collects or nuisances are created. 22. The cavalry stables are between the lines of pendalls, each man living immediately behind his horse. They are simply sheds, or a long connected roof covering 50 horses in each row. The stalls are open, so that there is a free passage of air. The line refuse is removed daily, and spread out on the camp roads. 23. The married men all live with their families, in houses built by themselves, well in rear of the lines. None are allowed to remain in the lines.
Officers' Quarters.	1. The officers' houses are surrounded with nice well-kept gardens and trees. No particular measures for drainage are required. The trees are kept well cropped, to ensure ventilation. No improvements are suggested.
IV. Health of the Troops.	1. The seasons at Jacobabad vary extremely, and there is a corresponding amount of sickness or otherwise. From May to September the weather is intensely trying; the daily amount of sick is then from 1½ to 2 or 3 per cent. The annual number of deaths is low in the regimental hospital. It is highest in the civil hospital, numbering 12 last year, which is about an average. The district consists of a desert, here and there cultivated, and but scantily populated. With the exception of the usual fever of the country, and from which few escape, the native inhabitants appear generally speaking healthy; but for an unlimited period of residence the same cannot be said of the European inhabitants of the station, the climate being so extraordinarily trying. 2. Intermittent, quotidian, and tertian fevers are most frequent among the natives, particularly in the autumn; which diseases are in the winter and spring complicated with chest diseases, and not unfrequently with diarrhœa and dysentery. These are the most frequent causes of death. Eye disease, which has mostly assumed the chronic form at the time of application for relief, also occurs. Spleen disease is common, but less so than might be expected, and chronic rheumatism is also frequent. 3. I cannot say how miasma is generated, but all azotized matter serves as a nidus of infection. As Faraday found with what facility organic matter clings to an earthy pulverulent substance, and showed that sand was rich in ammonia, the habitat of this noxious agent is co-existent and as extensive as the desert we inhabit. Add to this the terrific heat and the deadly simoom, and an idea can be formed of the climate of Upper Sinde. In December, January, and February the cold is greatly felt, particularly by the poorer classes, the thermometer having been as low as 29° outside at 6 a.m., with occasional heavy falls of rain, and a bleak north and north-east wind. As a natural consequence the natives suffer from chest disease, rheumatism, and disease of the bowels. To those who are able to provide suitable clothing and comforts this cold season proves restorative after the debilitating effects of the hot weather. 4, 5. The troops now at Jacobabad are all natives, and have been there for the last 13 years. No portion of the men's present accommodation is more unhealthy than the rest. The troops are always moved about in the cold weather, and kept in camp as much as possible with advantage to health. 6, 7. No experience of hill stations. 8, 9. I am of opinion that for preserving health well-selected hill stations are most suitable for troops. The European troops should be massed as much as possible at such stations, and moved about in camp in the plains in the cold weather for military exercise. To restore health hill stations are almost useless. European soldiers should be sent to England for change, as it would be cheaper in the end. 10 to 13. No experience of hill stations. 14. I should say that the course most conducive to the health of troops serving in India would be to locate them as much as possible in well-selected hill or other healthy stations, such as Kurrachee, Poona, and Belgaum in the Bombay Presidency, and only send them to the plains when absolutely necessary or for exercise in the cold weather. Fixed headquarters, with comfortable quarters for married people, having garden plots, &c., good workshops for men, baths, ball courts, &c., would make residence in one spot preferable to change. Marching exercise in the cold country should always be practised. 15, 16. No experience of hill stations. 17. There is no higher ground near the station, that I am aware of, which could be advantageously occupied as a hill station. 18. No experience.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops—*cont.*	19. Soldiers proceeding to India should be 20 years of age, and should land there in November. It would be highly advantageous if recruits could always be marched by easy marches in in the cold season, under good commissioned and non-commissioned officers, from the place of disembarkation to their future station, as it would greatly aid their training, physically and morally. 20. If not sent till 20 years of age troops might be sent direct from home to India, and on landing should be sent, if possible, at once to their regiments. 21. The mode of transport through Sinde has hitherto been by the Indus by steamers. Arriving early in November, they might be marched to any part of the Punjab or North-western provinces; and this would, I think, be preferable. The confinement on board the steamers is particularly irksome and bad. 22. If barrack accommodation were better, if means of employment for the soldier were more supplied, and the Indian life made more endurable to them, I believe all soldiers of the local army would gladly enlist after their first term has expired. Regiments of the line should be relieved every 10 years, those men who liked being allowed to exchange and remain. 23. I have no suggestions to make as to the mode of conducting medical boards in regard to invaliding. 24. Invalids should leave India in the cold weather, so as to arrive in England in the spring.
Diseases.	1. There are no regular inspections for the discovery of incipient diseases at the station. 2. Scorbutus has only appeared once or twice in the regiment in six years, one case being at an outpost, when probably vegetables were scarce. In the jail, however, there are always a few cases, but seldom more than six. An extra is then allowed for vegetables, with lime juice, &c. The preventive measures are, the use of anti-scorbutics and other general means. 3. Few, if any, cases of hepatic disease, uncomplicated with other diseases, are met with, but I have seen two or three cases of abscess of the liver. In one case there was original disease of the lung, in another there was no clear history; a dispensary case. Jaundice is occasionally treated, and congestion of the liver, and other derangements, both functional and organic, are not rare. 4. Dracunculus is rarely met with in Upper Sinde, but a case now and then presents itself, once or twice perhaps in a year, among the dispensary patients. In the regiment also three or four cases may be treated, but in one or two of the latter instances the patients had lately arrived from the Deccan. 5. The proportion of constantly sick from venereal disease to the total sick admitted in the hospital was,—

			Total all other Diseases.
In 1856, syphilis, primary	6		
„ secondary	6		
	—	12	1,155
In 1857, syphilis, primary	13		
„ secondary	8		
	—	21	717
In 1858, syphilis, primary	8		
„ secondary	5		
	—	13	993

6. The troops suffer from—

Fever of the endemic intermittent form.

Dysentery.—Not very frequent in the regimental hospital, the men usually applying before the complaint has got so far, and consequently a diarrhœa is cured which might be called dysenteric; but at the dispensary, from neglect, cold, and other adverse circumstances, the case is different, and there are often cases under treatment, and these serious and long continued.

Cholera is unknown, I believe; at least I have not seen or heard of a case beyond one resembling a sporadic case six years ago.

Small-pox.—One case in an adult and two or three among children in the course of seven years. These occurred in 1854 or 1855. I heard of one case in a child this spring.

Rheumatism.—Chronic rheumatism and neuralgia is extremely common, and unfortunately often slow in recovery. Acute rheumatism with heart disease is seldom met with; indeed I do not recollect a case occurring here.

The proportion of admissions and deaths from rheumatism to the total admissions and deaths from all diseases is—

	Diseases.	Admissions.	Deaths.	Total Admissions from all Diseases.	Total Deaths.
1856.	Rheumatism, acute	25	1	1,128	3
	„ chronic	14			
1857.	„ acute	15	1	700	10
	„ chronic	23			
1858.	„ acute	2	None	971	7
	„ chronic	33			

7, 8. I do not remember any instance of zymotic disease. The bazaar has a good supply of water from wells, two large tanks, and numerous nullahs. Cleanliness has been particularly attended to, and the lines have been recently built and improved, and extremely good and capacious, allowing of free ventilation. There are no habits among the troops which predispose them to zymotic diseases.

9, 10. Men attacked with malarial disease go into hospital and undergo a regular course of treatment. Officers and men, however, when they find that fever is about them, take quinine, which wards off or cures an incipient attack in a day or two. This occurs once or twice a month, on the changes of the moon.

References to Subjects and Queries.	Replies.
V. Intemperance.	1, 2. The questions under this head evidently refer to European regiments only. The troops at Jacobabad are all natives: two-thirds Mussulmans to one-third Hindoos. All, more or less, drink ardent spirits, but instances of drunkenness among them are rarely seen. Drunkenness is punished as an offence when it causes either neglect of duty or interference with the comfort or convenience of others. 3. Distilled spirits are sold in the bazaar by a contractor who has the sole licence to open shops for the sale of liquor, but I cannot say what is the probable amount consumed by each man per diem. Spirit is only given to convalescents in very rare cases of excessive weakness. No other drinks injurious to health, besides intoxicating drinks, are sold in the bazaar. 4. It depends entirely on the soldier and his habits whether spirit is conducive or injurious to health; but the excessive consumption of it must be detrimental to efficiency and discipline. 5. With regard to the question as to whether it would be beneficial or otherwise to restrict or abolish the use of spirituous liquors in the canteen or bazaar, if the men had better means of recreation when not on duty, they would not feel so wearied by an Indian life and would not seek forgetfulness, or in some cases necessary support, in stimulants. 6. I should say malt liquors are decidedly preferable to spirits. Lord Dalhousie ordered the experiment to be tried largely. Officers with European corps can say how it succeeded. 7 to 10. These queries do not apply to this station. 11. No bazaar regulations exist. People buy as they like from the shops opened by the liquor contractor.
VI. Diet.	Not applicable to native troops.
VII. Dress, Accoutrements, and Duties.	1. The cavalry wear a dark green alkaley and pantaloons, and in cold weather a sheepskin jacket over-all, the wool inside. The infantry wear a brown double cloth tunic, with pantaloons to match. In summer all wear cotton clothing, that of the cavalry being white and that of the infantry dyed brown. The clothing is very suitable to the climate and for the soldiers' duties at all times. The head-dress lately introduced in the Bombay army—a light wicker-work helmet, with cover and puggree—is a very good one.
Duties.	1. Recruits should be drilled at home before being sent to India; his bodily strength would thus improve, and his first impressions of the country would not be mixed up with the wearying task of the drill ground. 2. All the year round there is brigade parade once a week, and each regiment parades over separately; besides awkward men are sent to the drill squads. Parade and drills last about an hour and a half. The best time for drills, parades, and marches is early morning, except in the cold weather, when none should be attempted, unless otherwise necessary, before the sun has well risen. The men have six nights in bed during the week. 3. No guards are mounted at a greater distance than a mile from barracks; guards last 24 hours. There are roll calls every evening at sunset, Sundays excepted. Night guards have no ill effect on health.
VIII. Instruction and Recreation.	1. There is a good fives court, which has the best effect of maintaining the health of the European officers. No other means of recreation exist. 2, 4. Do not apply at this station.
IX. Military Prisons.	1. There are no cells or military prison at the station.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency medical regulations. 2. The commanding officer is responsible for the conduct of the line of march, bivouacking, &c., and when he is in doubt would take advantage of any information the medical officer could supply him with. 3. Strict cleanliness is always enforced in camp; and any suggestions by the medical officer always receive prompt and full consideration. 4. The arrangements for field hospitals, ambulances, transport of the sick, &c. are the same throughout the presidency.
XI. Statistics of Sickness and Mortality.	The following table gives the required information under this head.

Native Troops.

Years.	Corps.	Strength.	Fevers.		Eruptive Fever.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1852–53	1st Regiment Sinde I. Horse 2nd do. do.	1,473	2,136	19	—	—	13	1	7	—	89	7	6	—	—	—	795	—	3,046	27	206·6	1·8
1853–54	1st Regiment Sinde I. Horse 2nd do. do.	1,464	688	9	—	—	26	2	3	—	43	—	9	—	—	—	846	2	1,615	13	110·3	0·8
1854–55	1st Regiment Sinde I. Horse 2nd do. do.	1,462	769	6	1	—	29	2	4	—	61	—	13	—	—	—	963	3	1,840	11	125·8	0·7
1855–56	1st Regiment Sinde I. Horse 2nd do. do.	1,498	1,010	5	—	—	11	—	1	—	35	—	6	1	—	—	669	1	1,732	7	115·6	0·4
1856–57	1st Regiment Sinde I. Horse 2nd do. do.	1,231	1,658	8	—	—	28	3	3	1	97	2	6	1	—	—	780	4	2,572	19	208·9	1·5
1857–58	2nd Regiment Sinde I. Horse 3rd do. do.	1,262	865	6	—	—	19	2	1	—	26	—	2	—	—	—	569	—	1,482	8	117·4	0·6
1858–59	1st Regiment Sinde I. Horse 2nd do. do. 3rd do. do. 1st Jacob's Rifles - - 2nd do.	2,924	1,774	10	3	—	37	2	6	1	112	4	8	1	—	—	2,121	4	4,061	22	138·8	0·7
1859–60	1st Regiment Sinde I. Horse 2nd do. do. 3rd do. do. 1st Jacob's Rifles - - 2nd do.	3,576	2,695	15	2	—	78	8	11	2	183	5	18	2	—	—	2,151	5	5,138	37	143·6	1·0

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, 9th November 1860.

W. C. Coles, Assistant Surgeon,
Secretary.

JACOBABAD. BOMBAY.

References to Subjects and Queries.	REPLIES.
XII. HOSPITALS.	1. Plan. 2. The hospital is in rear of the centre of the lines of each regiment. 3. The water-supply is abundant and wholesome. 4. Refuse water and other impurities are removed from the hospital by sweepers, there being no sewage to the building. 5. The hospital has only one floor, raised 2½ feet above the surface of the ground. Whenever rain falls, which is not often, it soon soaks into the soil or runs off into the trenches cut to water the trees. The foundation and plinth of the hospital is constructed of burnt brick and mud, the walls of sun-dried bricks and mud, and the roof of beams, tatties, mats, and rafters plastered with mud, and supported on light brick arches. The walls are single, but sufficiently thick to keep it cool for natives. There is a ten feet verandah all round, which affords good shelter. The hospital is used more as a dispensary; only the worst cases, requiring constant attendance, being kept in it; these are placed wherever it is coolest. The building consists of one flat, and is so placed as to receive the full benefit of the prevailing winds. The windows can be opened completely so as freely to admit the air. 6. The ventilation of the wards is good. There are no jalousies or jhilmils. 7, 8. There are no means of cooling or warming the wards. The hospital is cleansed and whitewashed about once a year, or whenever necessary. 9 to 13. There are no privies. The men make their own arrangements for cooking, washing, &c. 14. The men supply their own bedsteads and bedding. The bedsteads are made of common wood, with string stretched across. 15. There is no hospital kitchen. 16. There are no diet tables or diet rolls, &c. 17. When there are very bad cases in the hospital the patient is allowed to have a comrade to attend on him. 18. The sanitary condition of the hospital is good; and no pyæmia, epidemic disease, or gangrene have appeared in the wards. 19. There are no sanitary defects to remark upon or improvements to suggest. 20. This query does not apply to this station. 21. Soldiers' sick wives and children are treated by the medical attendants at their own houses. The present arrangements are satisfactory. 22. There are no special local hospital regulations not included in the general presidency medical regulations. 23. The hospital arrangements are left to the medical officer; and any requisition or suggestion of his is promptly listened to and complied with if expedient. 24. There are no wards or hospital for convalescents at this station.
XIII. BURIAL OF THE DEAD.	1. The Mussulman burial ground is about half a mile to the west of the station, and on the opposite side from that from which the prevailing wind blows. 2. Its area is about 1,200 square yards, the soil is alluvial and sandy, and decomposition rapidly takes place. The ground is carefully kept. 3. There are no regulations with regard to graves; but they are never less than 8 feet in depth. They are never reopened. Interment generally takes place within 24 hours, but in hot weather bodies sometimes interred within 12 hours. 4. The grave yard is never allowed to be offensive. These remarks apply to the Mussulmen, only two Europeans (officers) have ever been buried at the station. 5, 6, 7. The dead of bazaar people are disposed of according to caste—the Mussulmen are buried in burial ground, and Hindoos are burnt at a spot south-west of the station. No injury to the public health accrues from the present practice; no improvements in the manner of disposing of the dead are necessary.

(Signed) W. L. MEREWETHER, Major,
Commandant-in-Chief, Sinde Horse,
F. F. Force.

11th August 1860.

DHARWAR.

Accommodation. Native Troops.—Infantry - - - 900.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. There are undulating and somewhat barren hills in the country surrounding the station, on the north, south, and west sides. On the east a black cotton plain, not perfectly flat, but in gentle swells and valleys. The general aspect of the country is hilly and dry. There is no wood or jungle in the vicinity, and no large sheet of water; but a few small tanks in the environs. 2. The elevation of the station above the sea is 2,482 feet. It cannot well be said to be above the adjacent country, which is all much of the same character; but the ground occupied is thoroughly well drained. A very small nullah runs through the station which dries up almost immediately after the rain has ceased falling. There is no marsh nor anything of the sort; and the nearest tank is 2 miles off, and is not larger than the Serpentine. The best ground appears to be that on which the station is built, and there is none higher or healthier in its vicinity. 3. There is no mountain or table land near the station. Dharwar is situated on a number of little hills, and similar features of ground are met with to the west until the Ghauts are reached. Dharwar is on the spot where the water shed divides, and consequently on the highest ground generally; though some isolated hills 30 to 40 miles away from the station, between it and the Ghauts are higher by about 500 feet. Dharwar is generally higher than the crest of the Ghaut; but 2 similar isolated hills are about 4 or 500 feet higher than Dharwar; all such hills are from 30 to 40 miles distant. To the east the ground falls away to the Madras coast many hundred miles distant. 4. With the exception of wells and drinking water reservoirs, there is no water near the station; and there is no overflow of water in the vicinity. There is a little broken ground towards the north between the jail and the fort, but well to leeward, and has no effect on the health of the station.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	5. The roads through the station have trees planted along their sides, and there are gardens and hedges, but the ventilation (owing to the high situation and size of the enclosures, which, with the exception of the hedges, are generally quite clear of vegetation) is perfect. The temperature of the station is not raised by exposure to reflected sun heat. The station is exposed to the sea breeze, which in the hot weather begins to blow late in the day, and to prevent a chill, very thin clothing should not be worn in the evening, otherwise its effect is refreshing and healthy. The land or east wind also blows particularly in December, January, and February, and is apt to cause rheumatism, &c. 6. The surrounding country is cultivated where the land is good, but owing to its barren hilly nature on the south, west, and north, there is a good deal of open land bearing a poor crop of grass, and which is used for grazing cattle only. The land in the valleys on the outskirts of the station in places is formed into terraces for the cultivation of rice; but beyond these terraces, which collect the rain water a little, there are no works of irrigation. This has not been observed to have any ill effect on the health of the station. There is no prohibition to the cultivation of rice, which is but trifling at the bottom of the neighbouring valleys. Neither the cultivation of indigo, nor the preparation of hemp or flax is carried on near the station. 7. To the east of the station and joining it there is a large native town with suburbs. 8. The geological structure of the station is metamorphic clays, and mica schists, &c. The fort has been occupied by the natives for many years, but the surrounding hillocks on which the station is built, were probably not occupied by dwellings before. 9. The depth of water below the surface, owing to the undulating character of the ground, necessarily varies; in some cases, the wells are but 20 feet deep, in others from 90 to 100 feet. The rise in the wells in the rainy season is but a few feet, and many become perfectly dry in the summer. As a rule no water is injuriously near the surface at any part of the station. 10. The rain fall flows readily away from the surface, and no drainage from higher ground passes into the subsoil of the station. 11. The water supply of the station is derived from wells and tanks. There are no tanks in the station; but immediately contiguous to it there are one or two which supply the inhabitants of the town, the extent of the surface of which is in all about 30 acres; there are also two tanks within the fort. The former of these tanks are generally dry in the hot weather; but those in the fort have a good supply of water all the year round. They contain neither plants nor animals. No bathing is allowed in a tank used for drinking purposes, and in no case is there pollution from leaves or other matter falling into them. No nuisance or malaria is experienced from the tanks. 12. The water is very good and wholesome, and there is always plenty for drinking; but for washing, &c. the supply is rather scanty in hot weather. The means are not available to give its chemical composition or microscopic characters. The water is good and not injurious to health, with the exception of its being supposed to give rise to Guinea worm among the natives. The amount is generally sufficient for drinking and cooking purposes. It is of a tolerably soft quality, and is raised from the wells by a simple bucket and string. No better supply is necessary. 13. No other topographical points occur. The station is one of the healthiest in the Bombay Presidency. 14. I am unable to say what amount or kind of enquiry is gone through as to topography, climate, sanitary condition, &c. before a new station is selected, as during my experience a new one has not been chosen.
II. Climate.	1. There are no instruments available at this station for conducting and registering meteorological observation, with the exception of a common thermometer and rain gauge. 2. Table of Meteorological Observations from 1st January 1859 to 30th April 1860.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain, inches.	Winds.		Days of Sunshine.	Remarks.
										Direction.	Force.		
	°	°	°	°	°	°	°	°	°				
January -	—	72	22	83	61	—	—	—	—	E. & N.E.	Usually high, mod. occasionally	31	Sky clear, occasionally cirri.
February -	—	80	18	89	71	—	—	—	—	E.N.E.&S.W.	Do. do.	28	Do. do. do.
March -	—	83	18	92	74	—	—	—	0·30	Do.	Do. do.	31	Do., occasionsionally heavy dews in the mornings.
April - -	—	82	18	91	73	—	—	—	2·02	N.E. & S.W.	Moderate and calm.	20	Latter part clouds and sunshine, cumuli, with occasional thunder and lightning.
May - -	—	84	14	91	77	—	—	—	5·36	S.W. & E.	Do. do.	—	Sunshine and clouds — cumuli — occasional thunder and lightning.
June - -	—	79	8	83	75	—	—	—	1·61	S.W.	Monsoon.	—	Cloudy and occasional sunshine—nimbi.
July - -	—	76	7	80	73	—	—	—	11·77	Do.	Do.	—	Do. nimbi.
August -	—	73	7	77	70	—	—	—	5·68	Do.	Do.	—	Do. do.
September -	—	73	7	77	70	—	—	—	2·84	Do.	Do.	—	Do. do.
October -	—	76	11	82	71	—	—	—	1·46	S.W. & E.	Do.	—	Sunshine, and occasionally cloudy.
November -	—	77	16	85	69	—	—	—	0·65	E.	Moderate	30	Cloudless.
December -	—	72	16	80	64	—	—	—	—	Do.	Do. occasionally high	31	Do.

DHARWAR. BOMBAY.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	3. The climate is very good. November, December, January, and February, especially the first three months, are dry and cool. There is a good deal of moisture in the air in March, April, and May up to June, when the rains commence. From February to June the climate is hot in the day time, but generally cool at nights. The climate is never very cold, but occasionally foggy in the hot weather in the mornings; the temperature, also, is pretty equable. The effects of tree planting in the station are beneficial. There is no irrigation in camp, nor any impurity of air. The health of the troops (natives) is very good. No particular kind of diet, shelter, or clothing is necessary, neither is any particular precaution required (beyond what is usually adopted in all cases) as to the amount of duties, &c. I may state that the Europeans, when stationed here for a short time (two years), enjoyed very good health. During the stay of the regiment here (about 16 months) July, August, September, and October have been the most healthy, and November, December, and January, when fevers and rheumatism were the most prevalent diseases, the most unhealthy months. 4. There is no district near the station, the climate of which is more conducive to health than that of the station. 5. The following is a list of stations at which I have served, with my observations on their comparative salubrity, viz.,—Upper Sinde, unhealthy; Mhow, healthy; Deesa, healthy; Bombay, unhealthy; Asseerghur, healthy; Sholapore, healthy; Belgaum, healthy; and Dharwar, healthy. The last two-named stations are the most healthy for Europeans, but I can scarcely say which is the most healthy for natives.
III. SANITARY CONDITION OF STATION.	1 to 15. No answers to these queries, there being no barracks at Dharwar. 16. There are no foul ditches near the station. 17. The surface cleansing of the cantonment is performed by sweepers, and the rubbish is buried at a distance or burnt; the cleaning is efficiently done. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c. interfering with the ventilation of the station or bazaar, &c. 19. The bazaar is crowded and narrow, and the ventilation very imperfect. There is no supply of water, but the drainage is good, and cleanliness is ensured by frequent inspections. The filth is carted away. There are no regulations for preserving cleanliness in the bazaar further than that each householder is responsible that no filth is allowed to accumulate in front or rear of his house, and that all rubbish is cleared away by a certain hour morning and evening. The condition of the houses in the town is generally good, and there are no dungheaps or cesspits within them. No nuisance is experienced in the station from wind blowing over the native buildings. 20. The slaughter-houses are of a considerable distance from military limits. The offal is buried, and no nuisance is experienced. 21. No horses are allowed to be picketed in the bazaar, but they are kept always in the town, and no inconvenience is experienced. 22. There are no cavalry or artillery at Dharwar. 23. There are no quarters for married non-commissioned officers or men at this station.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is very good; the bungalows are well ventilated, and the grounds well drained. No improvements to suggest.
IV. HEALTH OF THE TROOPS.	1. The station, district, and adjoining population are healthy. 2. The diseases most prevalent among the natives are fevers, bowel complaints, rheumatism, and guinea worm; cholera every now and then makes its appearance epidemically, but there is scarcely any spleen disease. 3. I attribute the healthiness of the native population to the following facts;—the country is generally speaking, open, well cultivated, and free from malaria; in the town of Dharwar sanitary measures are tolerably well carried out for a native town; the heat is never very great, the nights generally cool, and the natives generally in this part of the country are well-to-do, and contented. 4. The troops at this station were at Belgaum about four and a half years, with the exception of about 13 months, when the greater part of the regiment was in Persia. They left Belgaum on the 22nd December 1848, and were then in a good state of health. The principal diseases there were fevers, bowel complaints, and rheumatism. They arrived here on the 25th December 1848 in a good state of health. Fevers, bowel complaints, rheumatism, an outbreak of epidemic cholera, and latterly, guinea worm, have been the principal diseases since coming here. No portion of the accommodation here, as regards the sepoy lines, is more unhealthy than the rest. 5. The troops at the station are not camped out. 6 to 13. I am unable to answer these queries from a want of experience of hill stations. 14. Frequent change of stations in the plains is beneficial to the health and spirits of troops, if the stations be healthy, and the men march in cold weather. 15. I have no knowledge regarding the barrack and hospital accommodation at hill stations. 16. I cannot say, from inexperience, what ranges of elevation above the sea, are most suitable as sites for hill stations. 17. There is a hill on the Ghauts at Kerowlee which has been recommended as a sanitarium. It has good water on the top and table land convenient for building and exercise. Its distance from the station is about 45 miles, and to reach it about 3 miles of road on the plain (to connect with an existing road) would have to be made, and a road up the hill itself. Its elevation is about 3,000 feet above the sea. 18. I have had no experience to enable me to say what classes of surface and sub-soil are the most healthy or unhealthy. 19. I should say that from 20 to 25 years of age is the best age for a British soldier to proceed to India, and he should land here in the cold weather. In my opinion, strict enjoinment of temperance in eating and drinking, clothing suitable to the climate and season (especially as regards head-dress), exercise short of fatigue, as little exposure to the heat of the sun as possible, together with an approved system of barrack accommodation with all its appliances, moral and physical, would be the best means to resort to, to preserve the health of the recruit.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	20. My experience with European troops has not been great; but I am much inclined to think that sending them out to India direct would, on the whole, be the best plan. European troops on landing should always, if possible, be sent to cool and elevated stations, such as those on the table lands in this Presidency, Poona, Kirkee, Belgaum, &c. 21. There is no water transport from the port to the interior in this Presidency for troops, but they must either march, or are conveyed by bullock dawk, or railway carriages. I have never seen either of these modes of transport in operation, and am unable to give any opinion as to their fitness for preserving the health of the soldier en route. 22. As far as my experience goes, I think that from 12 to 15 years should be the extreme period of service in India for an European soldier. I mean for the soldiers generally in a Queen's regiment (line). 23. In my experience the manner of conducting medical boards, as regards invaliding, has always been such as to avoid conflict of opinion. 24. Invalids proceeding from India home should leave so as to arrive about the beginning of summer.
Diseases.	1. There are no inspection parades for the discovery of incipient diseases at this station. 2. There has been no scorbutic disease at this station. I have never seen this disease affecting any of the troops in this country, except during the Persian campaign, when it made its appearance to some extent amongst the natives, arising from bad water, and a deficiency of vegetables. When the causes were removed the disease soon disappeared. 3. Hepatic disease has been very rare in the regiment since its arrival here. There has been only one case, and that a slight one. 4. The proportion of cases of dracunculus usually under treatment, since the arrival of the regiment here, has been about eight per cent. The disease is supposed to arise from the use of water, but whether it is the external or internal use of it, or from its being used in both ways, that gives rise to the disease, is a point not yet cleared up. I know of no preventive, though perhaps boiling the water before use might act as such. 5. The proportion of venereal diseases, since the arrival of the regiment here, has been about eight per cent. I have not had very much experience with Europeans; but from all I have seen and heard, I certainly think it would be advantageous to establish lock hospitals. 6. The troops at this station have suffered from the following diseases :— *Fevers.*—Intermittent fever is the most prevalent disease here amongst the sepoys, but they do not suffer much from it, as it is generally of a mild uncomplicated nature. A few cases of remittents have also occurred, but most of them of a mild description. *Dysentery.*—Only four cases of this disease have been admitted at this station, and, with one exception, were of a very mild and simple kind. *Cholera.*—An outbreak of this disease in the epidemic form occurred in the months of last May, June, and July. The great proportion of cases taking place in May. It appeared in the most virulent form. *Rheumatism.*—This disease generally occurs in the chronic form, and is often very long and tedious in its cure.

The following table shows the proportion which admissions and deaths from the above diseases bear to the total admissions and deaths :—

Diseases.	Admissions to Total Admissions.	Deaths to Total Deaths.
Intermittent Fever - - - -	23 per Cent.	No deaths.
Remittent ditto - - - - -	1·5 „	Ditto.
Dysentery - - - - -	0·6 „	4·5 per Cent.
Cholera - - - - -	4·7 „	77·2 „
Rheumatism - - - - -	8·0 „	No deaths.

	7. The more frequent zymotic diseases belong to the miasmatic class; but the enthetic and parasitic orders also comprise a considerable number of the prevailing diseases. These diseases are mostly prevalent in the hot and cold weather. The means are not available at this station to test and record any atmospheric or climatic conditions and changes that might precede or accompany such diseases; but no such conditions or changes have been observed. In the station itself, these diseases have been most prevalent in the sepoys' lines. Their sanitary condition, with the exception that they adjoin the town of Dharwar, at their eastern extremity, is very fair. I am not aware that any particular part of the town of Dharwar is more liable to the above diseases than another. For a native town, sanitary measures are tolerably carried out in Dharwar, I believe. The personal habits and conditions of the natives, such as regard their general want of cleanliness, not only with respect to themselves personally, but in and around their houses; their close and badly-ventilated dwellings; their often poor and scanty food and clothing, with many other causes, will always predispose them (the natives) to zymotic diseases. 8. This question refers to European troops. 9. Small doses of quinine have not been tried as a prophylactic against malarial disease at this station. 10. Beyond a strict enforcement of all sanitary measures I have no recommendations to make on any of the preceding points, except it be, that when epidemic disease, such as cholera, makes its appearance amongst the troops of a station, they ought, if possible, to be marched out of camp some little distance, and there located for a time.
X. Field Service.	1. There are no local regulations for field medical service not included in the general Presidency regulations. 2. As far as my experience goes, medical officers are rarely if ever consulted as to the conduct of a line of march, billeting, &c.; but at the same time I am of opinion that good practical suggestions from medical officers, would generally be attended to. 3. As far as my experience goes, which has been limited as regards field service, camp regulations for the preservation of health were good, camping grounds well selected, and general sanitary regulations well carried out. The water supply generally abundant; but the water not always to be had of the best quality; in fact, often bad. I am of opinion that tents on field service are generally too much crowded, and field hospitals also. I cannot say what

DHARWAR. BOMBAY.

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	powers other medical officers may have had in these matters, but any suggestions I have ever thought it advisable to make regarding those under my own care, were always to the best of my recollection followed. 4. The arrangements for field hospitals, ambulances, &c., &c., are detailed in the medical code of regulations of the Presidency.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. The following table gives the statistics of sickness and mortality :—

DHARWAR.—EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Dead.	Diseases of the lungs. Treated.	Diseases of the lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per Cent. to Strength. Died.
	Queen's Troops.																					
1858-59	8-14 Royal Artillery - - - Detachment H.M. 56th Regiment -	144	50	1	—	—	16	1	7	1	46	1	4	—	1	—	156	1	280	5	194·4	3·4
	European Troops in the Indian Army.																					
1857-58	Detachment 2nd European Regiment - - - -	82	77	—	—	—	4	—	1	—	11	—	5	—	—	—	82	—	180	—	219·5	—
1858-59	Ditto ditto ditto -	20	5	—	—	—	—	—	—	—	1	1	—	—	—	—	5	—	11	1	55·0	5·0
	NATIVE TROOPS.																					
1852-53	5th Regiment Native Light Infantry -	727	278	1	3	—	1	—	1	—	39	2	4	—	—	—	218	2	544	5	74·7	0·6
1853-54	5th ditto ditto -	700	402	—	4	—	6	—	2	—	32	—	5	—	1	1	325	1	777	2	110·9	0·2
1854-55	5th ditto ditto -	665	263	5	10	—	3	—	—	—	45	—	9	1	2	—	298	—	630	6	94·7	0·9
1855-56	5th ditto ditto 28th ditto N. ditto Detachment 29th ditto ditto	741	173	—	8	—	9	—	2	—	60	1	4	—	—	—	318	—	574	1	77·4	0·1
1856-57	28th Regiment Native Infantry -	669	90	2	15	—	3	—	2	—	35	1	3	—	—	—	159	—	307	3	45·8	0·4
1857-58	28th ditto ditto -	866	135	—	11	—	8	—	1	—	55	—	3	1	17	3	313	1	543	5	62·7	0·5
1858-59	20th ditto ditto - 28th ditto ditto -	654	144	2	1	—	10	1	2	1	75	4	6	—	—	—	318	1	556	9	85·0	1·3

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General Medical Department,
Bombay, 17th August 1860.

W. C. COLES,
Assistant Surgeon, Secretary.

XII. HOSPITALS.

1, 2. There is a permanent hospital at this station for natives, but it was used by the European troops whilst they were located here. There is also a temporary hospital erected for the use of the native regiment. Both are well away from the bazaar. The permanent hospital is very much confined, being contiguous to out-buildings, &c., which obstruct the ventilation. The temporary hospital, on the contrary, is perfectly open, and thoroughly ventilated. Both sites appear to be perfectly healthy.

3. The water is brought to the hospital by bheesties, and is good.

4. There is no artificial drainage to either hospital, but refuse matter is carried away by sweepers.

5. These native hospitals are simple buildings on one floor. The floors are well raised off the ground by solid filling up, but there is no perflation of air beneath them. In the permanent hospital the roof water is received in open masonry drains laid in the ground below the eaves, and conducted away to a distance; in the temporary hospital it simply falls on the ground, which is on a slope, and is carried away immediately. The permanent hospital has brick and lime walls, with a double tiled roof, and is moderately cool. The walls of the temporary hospital are of lath and mud plaster, very thin, but still quite sufficient to keep the building cool. Each building has a verandah on each of its long sides 10 feet wide, which affords excellent shelter from the sun; they are not used for the accommodation of sick or convalescents. The temporary hospital is placed so as to receive the full benefit of the prevailing winds, but the permanent one faces too much to the south. The windows open perpendicularly in the centre, and are fitted in the permanent hospital with glass, and with venetians outside, and are perfectly well arranged for coolness and ventilation. The temporary one is simply fitted with plank shutters.

6. The ventilation of the permanent hospital is not good; it depends entirely on the doors and windows, and what little foul air can escape through the tiles. The temporary hospital has the roof at the ridge raised all along above the main roof, and overlapping it. The part of the main roof lying below it not being tiled, any foul air that collects must pass out at once. This arrangement has answered admirably. Neither jalousies nor jhilmils are required or used in the hospital.

7, 8. There is no apparatus either for cooling or warming the air admitted into the hospital wards. The walls and ceilings of the wards are limewashed four times a year.

9. The privies and urinals are simple sheds, with a passage for the sweeper at the back, who removes everything daily; no cesspits are consequently required. They are not supplied with water, but they are never offensive.

10 to 17. These queries refer to European hospitals alone.

18. The general sanitary state of my hospital (a temporary one) is very good. The only drawback to it in this respect is that were much sickness to prevail in the regiment, the accommodation would be too limited, but as yet it has not been found so. No epidemic disease, hospital gangrene, or pyæmia have appeared in the wards.

19. The hospitals with which I am acquainted are generally deficient in ventilation; their sites often not well chosen, and a bad arrangement as regards their wards. There is generally, if not always, a great deficiency of accommodation for the medical subordinates, and hospital servants.

20, 21, 22. No replies to these queries.

23. The powers of the medical officer are ample, I imagine, as regards repairs, changes of diet, medical comforts, and general arrangements of the hospital; but in any matter involving

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	much expense his suggestions to improve its sanitary state would probably, if carried out at all, only be so after considerable delay and trouble. 24. No reply to this question.
XIII. Burial of the Dead.	1. The European burial ground is about half a mile from the nearest occupied bungalow and is well to leeward. 2. It is about an acre in area, and its soil is a species of gravel formed by the decomposition of primary rocks, trap, or granite. It is kept moderately clean, and in pretty good order. 3. Being a burial ground for a small station, where interments do not often take place, there is plenty of room between the graves, none of which are ever reopened. Interment takes place within 24 hours after death, with natives within 12 hours. The native troops are buried or burned about three-quarters of a mile from camp. 4. The graveyard is never offensive in the slightest degree. British troops are buried as soon after death as convenient. 5. The dead of camp followers and bazaar people are disposed of in the same way and place as those of the native troops and townsmen. 6, 7. No injury accrues to the public health from the present practice, nor are any improvements to be suggested.

(Signed) Edward Baynes, Major,
Commanding at Dharwar.
W. Neilson, Surgeon,
H.M. 20th Regiment, Native Infantry.

12th July 1860.

RAJCOTE.

Accommodation.—Native troops.

Detachment 3/3 Artillery	38
1 Squadron 2d regiment Light Cavalry	139
H. M. 17th Regiment Native Infantry	846

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is that of a vast, undulating, flat, and stony plain, with cultivation in the vicinity of the town and cantonment. There is not much wood or jungle near the station, but a river which runs past the town of Rajcote is only half a mile distant from the station. 2. The station is 450 feet above the level of the sea, 100 feet above the adjacent country, and 100 feet above the river. There is no higher or healthier ground in the vicinity of the station. 3. The nearest mountain is the "Girnar," which is about 56 miles to the south-west of Rajcote, and is nearly 3,700 feet above the sea level; therefore, about 3,250 feet above the cantonments of Rajcote. 4. The nearest water is the river Ajee, which flows past the town of Rajcote at a distance of about half a mile from the cantonments. The vicinity of the station is not liable to overflow, as the water during the rains runs off into the river. There is no broken ground near the station, but a slight ravine, which runs through a portion of the camp, and which, during the rains, is usually full of water. It has not been observed to have a prejudicial effect on the health of the troops. 5. The station is thoroughly open to the sea-breeze, which blows steadily during eight months in the year. It is not encumbered with trees, hedges, or gardens, and there is nothing to obstruct its free ventilation. The temperature of the station is not raised to an appreciable degree by being exposed to reflected sun heat. During the months of November, December, January, and February the winds are northerly and north-easterly; but they have very little prejudice on health. The immediate surrounding country is cultivated. There are no works of irrigation near the station, and the cultivation of rice is prohibited within cantonment limits; none is grown in the surrounding country. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The town of Rajcote is the largest in the vicinity of the station, and is about half a mile distant from it. Its population is 7,000 souls. 8. The geological structure of the station is as follows:—Sandstone and trap; surface, black soil and subsoil stony. The ground on which it stands was never before populated. 9. Water is usually found during the dry season at a depth of from 25 to 30 feet below the surface, and during the rainy season at from 12 to 15 feet. 10. The rain-fall flows on the hard and rocky ground into the river; but in some places, where there is black soil, it does not flow away so readily. There is no adjacent higher ground. 11. The water supply of the station is derived partly from the river, but chiefly from wells in the cantonment; there are no tanks within three miles of the station. The wells are not liable to pollution from leaves falling into them; but if not constantly used, they become very foul from the accumulation of pigeons' excrement and rubbish from their nests. 12, 13. The supply of water is abundant, both from the river and wells; it is colourless, inodorous, and well-tasted. It has not been analysed, nor its microscopic characters observed, but it is of moderate softness, and its quality appears to be good, and not in any way injurious to health. It is raised from the wells by means of a leathern bucket and rope, with which the watermen fill their water-bags, or "puckalls," and is distributed through the camp by means of bullocks. There are no other topographical points bearing on the health of the station to be remarked on. 14. No reply to this question.

RAJCOTE.
BOMBAY.

References to Subjects and Queries.	REPLIES.
II. CLIMATE.	1. The following are the meteorological instruments available at the station :—One wet bulb thermometer, two common ditto, one mountain barometer made by Newnham of Regent Street, and a rain gauge, which latter consists of a copper funnel leading into a bottle, whence the water is daily removed and measured in a glass cylindrical vessel graduated to $\frac{1}{100}$ of an inch. 2. The following meteorological table contains the mean of four daily observations, viz., sunrise, 10 a.m., 4 p.m., and 10 p.m. The mean sun temperature contains the mean of observations taken only at 4 o'clock p.m., daily.

Table of Meteorological Observations from 1st January 1857 to 31st May 1860.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temp.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January -	29·75	69·2	19·7	77·7	58·7	69·0	55·0	103·3	None.	N. & N.E.	Calm and moderate.	29	
February -	29·71	75·0	20·7	82·5	61·8	74·4	57·2	111·0	„	„	Do.	28	
March -	29·71	82·0	21·3	89·2	70·7	81·2	62·1	116·8	„	N.W. & W.	Do.	30	
April -	29·68	86·3	19·3	96·5	77·2	87·2	67·5	118·8	„	Westerly.	Do.	28	
May - -	29·58	90·2	16·6	99·1	82·5	90·8	73·8	117·0	„	„	High winds.	30	
June -	29·59	89·1	12·0	95·0	83·0	89·2	77·5	110·5	4·21	„	Monsoon.	17	
July -	29·45	85·0	6·9	88·3	81·4	85·0	76·7	Cloudy.	8·30	„	Do.	7	
August -	29·56	81·5	4·8	84·0	79·2	81·7	76·0	„	8·94	„	Do.	3	
September	29·50	81·1	6·6	84·6	78·0	82·2	73·1	„	5·22	„	Variable.	18	
October -	29·73	83·0	11·5	88·6	77·1	82·8	69·2	119·0	None.	W. & N.	Calm and moderate.	29	
November -	29·70	77·3	21·3	86·1	65·8	85·1	56·8	123·2	„	W.N. and N.E.	Do.	29	
December -	29·85	72·5	15·9	79·1	63·9	70·8	54·5	110·0	„	N., N.E., and E.	Do.	30	

3. The climate of the station, on the whole, appears to be healthy. Variable monsoon weather from June to September, but the remaining eight months are dry; fogs are not frequent, mostly occurring in November and December. The climate of the station does not appear to be influenced by irrigation or tree planting, and the purity of the air is not much affected by admixture with dust or other impurity. Only native troops are at the station, and on these the influence of the climate appears to be favourable. A more substantial diet than what they usually allow themselves, as well as more spacious and better ventilated huts, would be desirable. The only precautions as to exercise, &c., at all necessary are the avoidance of long parades in April, May, and October, and too early parades in December and January. All the months appear to be healthy, except, perhaps, May, September, and October, the month preceding and the months following the rains, when fever is prevalent.
4. There does not appear to be any more healthy district near the station.
5. I served in Sinde for a few months, at detached periods, in 1856 and 1857; but at that time had no opportunity of making observations on its salubrity. The remainder of my service was spent on field service in Persia, and in the Indian navy.

III. SANITARY CONDITION OF STATION.

1, 2, 3. Maps and tracings of the station, barracks, and surrounding country forwarded.

4. TABLE of Barrack Accommodation.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
				Feet.							
Native Infantry, 682	1	Variable.	Variable.	12	—	—	—	—		None.	
Native Artillery, 35	1	do.	do.	12	—	—	—	—		None.	
		Ft. in.	Ft. in.								Ft. in.
Guard Room - -	1	15 9	6 9	8	—	—	—	—	2	4	3 6
Prison Cells, 4 -	1	13 3	10 0	34(?)	—	—	—	—	1*	1	4

* Ventilating.

5, 6, 7. There are no windows, verandahs, jalousies, or jhilmils at this station, nor any bedsteads, cots being used.
8. In huts the door is the only ventilator; in guard-rooms the ventilation is effected by means of the doors and windows, and in the tents any one side can be thrown open. The ventilation in the native huts is utterly insufficient; there are no means for cooling the air admitted to the barrack-rooms.
9, 10. Huts for sepoys are constructed of unburnt bricks and mud, and roofed with tiles. The floors are made of earth, slightly raised, and cow-dunged over occasionally.
11. The materials and construction of huts and tents are no doubt suitable for the climate, but the huts in the native lines might be much better ventilated. The barracks and cantonments are kept in repair by the barrack serjeant, and the staff officer is responsible for the general sanitary state of the cantonment.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	12, 13, 14, 15. Negative answers to all these queries.
	16. All nuisances are removed daily by sweepers from the station; there are no cesspits or foul ditches.
	17. An establishment of two sweepers is kept up for the removal of the refuse manure, &c. within the cantonment and its vicinity.
	18. The surface of the cantonment is kept as free as possible from vegetation, and there are no old walls or thick hedges, &c. to interfere with the ventilation of the station or bazaar.
	19. The bazaar is pretty well drained by one deep nullah, but there is no artificial drainage; the ventilation is indifferent, the water supply good, but there is a great want of cleanliness. There are no latrines, and the bazaar is overcrowded in parts. No rubbish is allowed to be burnt or to accumulate, nor are holes permitted to be dug for making bricks, &c. Each householder is held responsible for the cleanliness of his own house, and the adjoining street gutters, and no house is allowed to be built or repaired without the inspection and permission of the bazaar master. There are some dungheaps, &c. near the town, but beyond the limits of the cantonments. No nuisance is experienced by the troops from wind blowing over the native dwellings.
	20. There are no slaughter places at this station.
	21. There are very few horses in the bazaar, and these are kept in private stables, the rubbish from which is removed daily, and the manure carried off and sold at regulated times.
	22. There are no stables for artillery or cavalry horses, but they are picketed in the open air in front of the men's lines, and at a considerable distance from the hospital. There are no dungheaps, the manure being carried away and sold daily. Cavalry horses are picketed by troops, front and rear ranks facing inwards, about 60 paces in front of the men's lines, but at a considerable distance from the hospital.
	23. There are no quarters for married non-commissioned officers or men at this station.
Officers' Quarters.	1. The quarters for officers at this station appear generally to be clean and well ventilated; but the addition of upper stories would be very desirable.
IV. Health of the Troops.	1. The station and the district in which it is situated appear to be generally healthy, and the population of the neighbouring native town is perhaps more healthy than such populations usually are.
	2. Intermittent fever appears to be the only epidemic at all extensively prevalent here, and spleen disease, although frequent in other parts of the province, is not so in Rajcote. Cutaneous affections, however, are not uncommon, but small-pox has not prevailed for some years. Cholera existed, though not extensively, in July 1851, and in May and June 1854, and some cases have occurred this season.
	3. The healthiness of the neighbouring native population is attributable to the dryness and fineness of the climate; and sickness, when prevalent, to the filth of the houses and streets, and the entire absence of ventilation. The rapid evaporation also of the water from the surface covered with vegetation during the rains in September and October renders fevers then more prevalent.
	4. The left wing of the troops at this station arrived at Rajcote in June 1858 from Deesa, where it had been one year. The right wing arrived in January 1857 from Bhoog, where it had been 15 months; the state of their health on arrival was pretty good. At Bhoog intermittent fevers, scorbutus, and rheumatism were prevalent, from which latter diseases the men never suffered, chiefly since arrival here. There is no difference as to the healthiness of one part of the men's present accommodation over another.
	5. The troops at this station are never camped out.
	6 to 13. No reply to these queries, having had no experience of hill stations.
	14. I should think it would be more conducive to the health of troops serving in India to locate them on hill stations, with short periods of service in the plains; and I am also of opinion that troops should not remain longer than two years at any station.
	15, 16. No experience of hill stations.
	17, 18. There is no higher ground near this station which could be advantageously occupied as a hill station. My limited experience does not enable me to point out any particular class of surface and subsoil more healthy than another for stations.
	19, 20. British soldiers should not leave home for India before the age of 21 years, and should land here at the end of November or beginning of December. Recruits on first landing in India should be kept within barracks during the day, when they might be provided with indoor amusement, allowed to engage in any trade or art they may have acquired, furnished with suitable books, kept from the bazaar at night, and not allowed to indulge in excess of any kind. If these precautions were adopted, it would be scarcely necessary to send troops to intermediate stations, nor would it be necessary to send them at once to hill stations, and the dangers of the earlier years would thus be best diminished.
	21. I have had no opportunity of observing the mode of transport of troops from the port to the interior.
	22. I am of opinion that 10 years ought to be the maximum length of continued service in India.
	23. The manner of conducting medical boards here does not appear to tend to any conflict of opinion as regards invaliding of native soldiers.
	24. I consider the best period of the year for invalids to leave India for home to be in January and the beginning of February.

RAJCOTE. BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*—*Diseases.*	1. There are weekly inspections of the troops at this station by a medical officer for the discovery of incipient diseases. 2. During two years, terminating March 31st, there were five cases of scorbutus in the regimental hospital, or 0·25 per cent. of all other diseases. I have not myself seen a case of it, and it is of such unfrequent occurrence at this station as to render preventive measures unnecessary. 3. No case of hepatic disease is recorded at this station for the last two years; but recently I found an abseess in the liver of a sepoy who died of intermittent fever of long continuance, hepatic symptoms having been developed in the course of the other disease. 4. Only six cases of dracunculus, or 0·3 per cent. of all diseases, have been treated in the regimental hospital during the last two years. The medical subordinate attached to the civil hospital, and who has been resident for more than 15 years, states that during that time he has not seen more than five or six cases. 5. Venereal diseases during the last two years only formed 2·9 per cent. of all admissions to hospital, and they do not appear to be prevalent in native regiments, of which only I have any experience, and when they occur are usually of a mild and tractable character. Lock hospitals in large European stations would doubtless be advantageous. 6. The following are the diseases from which troops at this station suffer :— *Fevers.*—Ephemeral and intermittent fevers, chiefly quotidian. *Dysentery.*—They scarcely ever suffer from this disease. *Cholera.*—Not at all from this disease. *Small-pox.*—This also is unknown at this station. *Rheumatism.*—They suffer to some extent from this complaint. The following are the proportions which admissions and deaths from these diseases bear to the total admissions and deaths :— Ephemeral fevers - Admissions - - 291 or 24·4 per cent. Intermittent fevers „ - - 868 or 43·2 per cent. Ditto do. Deaths - - 4 or 26·6 per cent. of total deaths. Dysentery - - Admissions - - 14 or 0·19 per cent.; no deaths. Rheumatism - - „ - - 150 or 7·46 per cent. Ditto do. Deaths - - 1 or 6·6 of all deaths. These are the admissions for 1858–9 and 1859–60. There was no case of cholera or of small-pox during that time. 7. Intermittent fever is the only zymotic disease at all frequent here, and it is remarkable only for its mild character and the facility with which it yields to treatment. It occurs throughout the year, but is especially prevalent in September and October. The transition from wet to dry weather, and the rapid evaporation from the surface, which during the rains is covered with vegetation, are the climatic conditions which accompany this fever. Disease does not appear to be confined to any particular portion of bazaar or native dwellings, which are defective as regards cleanliness, drainage, and ventilation, with a crowding of dwellings. The water supply is, however, abundant. There have not been observed any particular habits or conditions of the troops or among the native population to predispose to the diseases in question. 8. So far as I have observed epidemic disease does not appear to be influenced by the sepoy's duties or occupations. 9. Prophylactic doses of quinine against malarial diseases have not been tried at this station. 10. From my experience I think that epidemic disease among native troops might be much mitigated were rations to be issued to them by the Government, inasmuch as from the smallness of their pay, and their great passion of hoarding up money, they will not expend enough to procure sufficient food. An improvement too is required in the native huts, which are much too small and entirely without ventilation.
V. INTEMPERANCE.	1. The soldiers at this station are usually temperate, and there are no confirmed drunkards among them. 2. There are no admissions into hospital for diseases caused directly or indirectly by intemperance, and drunkenness does not occur. 3. Distilled spirits are sold at one shop in the bazaar. That consumed by the troops is arrack, distilled from the flowers of the maura tree, and is not unlike inferior whisky in taste; its strength is variable. Spirits form no part of the ration for troops at this station, neither is it given as a ration to convalescents; but in hospital, brandy is given in some cases at the discretion of the medical officer. No drinks injurious to health other than intoxicating drinks are sold in the bazaar. 4. We do not deem the consumption of spirit, except in very limited quantity, conducive to health or to the efficiency and discipline of the corps. 5. We think it would be beneficial to the health of European troops to restrict the use of spirituous liquors and to abolish the sale of them in canteens and bazaars. 6. We are of opinion that the use of malt liquor or wines would have a more beneficial influence on health than that of spirits. 7. Coffee, tea, lemonade, soda water, &c. are not much used at this station, being confined exclusively to officers. 8, 9. It would be better to substitute beer, tea, &c. for spirits for the use of the troops, and to permit only beer, coffee, tea, &c. to be sold to them in the bazaar. 10, 11. No recommendations in addition to the above to make. There are no bazaar regulations on the above subjects at this station.
VII. DRESS, ACCOUTREMENTS, AND DUTIES. *Duties.*	1. We think it advisable that European troops should be drilled at home before being sent to India. 2, 3. No answer to these questions.

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation.	Rajcote has never been a station for European troops. A station library and gymkhana are established here, supported by the European officers.
IX. Military Prisons.	1. There are four cells in one building at this station, and these appear to be in a very satisfactory state as regards structure, ventilation, and sanitary arrangements.
X. Field Service.	1. There are no local regulations for field medical service not included in the General Presidency Regulations. 2. So far as regards native troops, of which only we have experience, the practical working of the powers of the medical officer appears satisfactory. 3. In my experience of native troops, the practical operation of regulations, sanitary or otherwise, has not been attended with difficulty or inconvenience. 4. On field service native troops are allowed one dooly and six bearers to every 100 men, and coolies for the carriage of medical stores, &c. Any carriage in excess of these is supplied by the commissariat upon the requisition of the medical officer, and for which indents are subsequently furnished. Sick extra carriage usually consists of native carts drawn by bullocks.
XI. Statistics of Sickness and Mortality.	The following return gives the required information :—

Rajcote.—Native Troops.

Years.	Corps.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	2nd Regiment Light Cavalry 8th Regiment Native Infantry 18th do. do.	978	888	5	—	—	11	1	7	1	88	1	15	—	3	1	568	3	1,580	12	161·5	1·2
1851-52	2nd Regiment Light Cavalry 3rd Company 4th Battalion Artillery 18th Regiment Native Infantry	1,169	852	—	3	—	48	2	8	—	63	2	14	—	6	1	515	4	1,509	9	129·0	0·7
1852-53	1st Company 3rd Battalion Artillery 3rd Company 4th do. do. 2nd Regiment Light Cavalry 18th Regiment Native Infantry	1,276	595	—	1	—	28	1	9	2	85	2	17	—	—	—	508	5	1,243	10	97·3	0·7
1853-54	1st Company 3rd Battalion Artillery 2nd Regiment Light Cavalry 18th Regiment Native Infantry	1,201	423	—	1	—	20	—	—	—	88	2	7	—	—	—	386	2	930	4	77·4	0·3
1854-55	1st Company 3rd Battalion Artillery 2nd Regiment Light Cavalry 3rd do. do. 18th Regiment Native Infantry Right Wing 23rd do. do.	1,231	570	1	2	—	14	1	8	1	146	—	14	1	4	3	527	4	1,285	11	104·3	0·8
1855-56	1st Company 3rd Battalion Artillery 3rd Regiment Light Cavalry 23rd Regiment Native Infantry	819	559	3	10	—	8	—	1	—	68	—	4	1	—	—	573	3	1,203	7	146·8	0·8
1856-57	1st Company 3rd Battalion Artillery 3rd Regiment Light Cavalry Wing 17th Regiment Native Infantry 23rd Regiment Native Infantry	843	491	—	6	—	18	—	5	1	68	1	7	—	3	2	351	1	949	5	112·5	0·5
1857-58	1st Company 3rd Battalion Artillery Wing 17th Regiment Native Infantry	420	110	—	1	—	17	1	—	—	21	—	1	—	—	—	166	—	316	1	75·2	0·2
1858-59	1st Company 3rd Battalion Artillery 17th Regiment Native Infantry	787	389	—	17	—	13	—	—	—	42	2	9	—	—	—	282	—	752	2	95·5	0·2
1859-60	1st Company 3rd Battalion Artillery Squadron 2nd Regiment Light Cavalry Detachment 14th Regiment Native Infantry 17th Regiment Native Infantry,	860	725	4	8	—	16	3	—	—	43	—	7	1	—	—	325	4	1,124	12	130·6	1·3

By order of the Acting Principal Inspector-General, Medical Department,
W. C. Coles, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay 29th September 1860.

XII. Hospitals.	1. There are two hospitals in camp, one used by the cavalry, and the other by the infantry; they are precisely similar, having been built on the same plan. 2. The two hospitals, which adjoin each other, are situated about 400 yards to the west of the lines, and to windward of them, and are about half a mile to the north-west of the bazaar. The site is open and nothing interferes with the ventilation, it is the healthiest site in every respect that the camp affords. 3, 4. The water supply is abundant and wholesome, but there are no means of drainage for the removal of refuse water and other impurities from the hospitals. 5. There is only one ward in each hospital, elevated about 18 inches above the ground; but there is no perflation of air beneath the floor. The roof water sinks into the subsoil, but there is an open drain by both hospitals, which carries away the rain-fall in wet weather with tolerable rapidity. The hospitals are built of sandstone and chunam, the roofs and walls are single, without ventilation between the roofs, they are not sufficiently thick to keep the hospitals cool. The hospitals are supplied with verandahs on both sides, 6 feet 5 inches

RAJCOTE. BOMBAY.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	on one side, and 13½ feet on the other or west side. These verandahs are only used for the accommodation of the sick when the hospitals are overcrowded. The hospitals consist each of only one story.

TABLE of Hospital Accommodation.
Total number of wards in each hospital, 1.

Wards or Hospital Huts. No.	Regulation Number of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
1	No regulated number.	Ft. in. 98 3	Ft. in. 22 9	Ft. in. 12 6 to the slope of the roof.	Not ascertained.	Variable.	Variable.	Ft. in. 1 4	16	Ft. in 4 10	Ft. in. 3 4

The hospitals receive the full benefit of the prevailing winds. The windows open outwards and their arrangement is conducive to ventilation.

6. The windows and doors of the wards are on opposite sides, and are the only means of ventilation; they keep the hospitals free of odour and closeness when not overcrowded. There are no jalousies or jhilmils.

7, 8. There are no means either for cooling or warming the air admitted into the wards of the hospitals. The ceilings and walls of the wards are cleaned and lime-washed four times a year.

9. There is one privy, distant 17 yards from the hospital, but no cesspits. The filth is removed and the place cleaned morning and evening by sweepers. The privy is not offensive.

10, 11. There are no lavatory arrangements for the hospitals; but tepid baths are available when required for the sick.

12. There is a washerman attached to the hospital, whose services are usually sufficient for washing and drying the hospital linen, &c.

13. The storage is sufficient for a native hospital.

14. The cots used in the hospitals are made of squared wood, laced with cotton tape, 6 feet 4 inches long, 2 feet 10 inches broad, and 16 inches high; the natives bring their own bedding. The substitution of iron for wooden cots is very desirable.

15, 16. There are no kitchens attached to the hospitals, nor any diet tables in force for native troops.

17. There is one hospital orderly for attendance on the sick, and in addition to the regulated number of second-class servants, sepoys are allowed, on the recommendation of the medical officer, to watch such cases as require constant attendance.

18. Occasionally the hospital is found too small for the number of the sick; but it does not appear that epidemic disease, hospital gangrene, or pyœmia has ever originated in it.

19. No other deficiencies or sanitary defects to notice, nor any improvements to suggest besides those already remarked upon.

20. In wet weather convalescents can only take exercise in the verandahs, at other times in the vicinity of the hospitals. There are no fenced grounds, shaded walks, or seats set apart for their use.

21. There is no arrangement for the treatment of soldiers' sick wives, as native women could scarcely be induced to submit to any; but children are frequently brought to the hospital to be seen and prescribed for by the medical officer.

22. There are no special local hospital regulations which are not included in the General Presidency Medical Regulations.

23. The only control over the medical officer as regards the sanitary state of his hospital, &c., is that exercised by the deputy inspector general of hospitals, whose sanction is, in most cases, necessary.

24. There are no wards for convalescents here, and for native troops such accommodation is hardly necessary.

XIII. BURIAL OF THE DEAD.

1. The European burial ground is situated within the station, but to the leeward of the lines and officers' houses.

2. The burial ground measures 243 by 226 feet, and is carefully kept. The rate at which decomposition takes place is unknown.

3. There is no regulated space for graves, but their depth is usually about eight feet; it is never found necessary to re-open them. There is no fixed or compulsory time for interment, but it always takes place in from 12 to 24 hours after death. The native troops, with very few exceptions, are Hindoos, and burn their dead; on an average not more than one sepoy being buried yearly.

4. The grave-yard has never been found offensive.

5. The Mussulman burial ground in camp adjoins the European one, but is not much used; the dead of camp followers and bazaar people being mostly burned.

6, 7. No injury has been observed to accrue to the public health from the present practice, nor have any improvements hitherto been found necessary.

(Signed) T. TOLFREY CHRISTIE, Lieut.-Col.,
Commanding at Rajcote.
C. B. LA TOUCHE, Lieut. H.M. 17th Regiment,
Staff Officer at Rajcote.
C. JOYNT, M.D., Assistant Surgeon,
H.M. 17th Regiment N.I.

July 22, 1860

KULLADGHEE.

Accommodation.—Native troops.

- Cavalry, European officers, 6.
- Sabres, 673.
- Infantry E. officers, 5.
- Native commissioned, non-commissioned officers, rank and file, 438.

References to Subjects and Queries.	Replies.
I. Topography.	1. The country surrounding the station is level, intersected by low hills, covered with stunted brushwood. It is scantily wooded, and there is but little jungle. There is an abundance of water in the vicinity of the camp. 2. The station is elevated above the level of the sea 1,750 feet; but is almost on the same level as the surrounding country. The nearest water is the Gutpurbah, a river of importance, in which there is running water all the year round. It flows within a few hundred yards of camp. There is no higher or healthier ground adjoining the station. 3. The nearest mountain or table land is 50 or 60 miles distant from the station. 4. The vicinity of the station is not liable to overflow. There is broken ground, but no place wherein stagnant water accumulates. 5. The station is open, and freely exposed to winds, and there is no obstruction to free ventilation. The temperature of the buildings is not raised by exposure to reflected sun heat. The influence of the periodical winds (N.E. and S.W. monsoon) is regularly experienced, as also the sea breeze, which is undoubtedly beneficial to health. 6. The country surrounding the station is cultivated to a considerable extent; but there are no works of irrigation. Rice is not cultivated in the neighbourhood, nor is the cultivation of indigo, nor the preparation of hemp or flax carried on near the station. 7. The town of Kulladghee, having a population of about 2,000 souls, lies about 250 yards to the N.E. of camp, and immediately outside its limits. 8. The site of the camp is upon new ground, with a red gravelly subsoil, resting on quartz and primitive limestone. 9. Water is found in the dry season at a depth of about 70 feet below the surface; and in the rainy season at about 60 feet. 10. The rain fall or water from surface springs flows readily away, and is rapidly carried off by nullahs towards the river. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived from the river and from wells. There are no tanks. 12. There is an abundant supply of water always available from the river and wells. Its quality is generally good, and by no means injurious to health. It is raised by the usual method of drawing from wells and rivers. 13. The natural drainage of the camp, and the consequent absence of those causes likely to generate malaria, combine to give the native troops a comparative immunity from diseases usually caused thereby. 14. The selection of sites for new stations is conducted by mixed committees detailed for the purpose.
II. Climate.	1. The only meteorological instruments available at this station are thermometers and pluviometers. 2. Table of meteorological observation from 1st January 1855 to 31st December 1859.

Months.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Rain, Inches.	Winds. Direction.	Winds. Force.	Remarks.
	°	°	°				
January -	76	89	60	0·05	Easterly.	Moderate	Days clear and cool, nights cold, no dew.
February -	79	92	66	—	Ditto.	Ditto.	Ditto, ditto.
March -	88	101	74	0·05	Ditto.	Ditto.	Day sensibly warm, nights cool.
April -	89	104	74	1·45	Ditto.	Calm.	Ditto, ditto, evening sea breeze.
May -	87	101	74	3·80	Variable.	Moderate	Days hot, nights cold, evening sea breeze.
June -	84	96	72	1·62	Westerly.	High winds.	Weather cool, cloudy, and occasional showers.
July -	82	91	73	2·94	S. Westerly	Ditto.	Monsoon weather.
August -	83	93	73	2·53	Ditto.	Ditto.	Ditto, ditto.
September	82	91	73	4·1	Ditto.	Moderate	Monsoon subsiding, weather hot and unsettled.
October -	79	91	68	6·67	Variable.	Ditto.	Cloudy days.
November	76	88	63	0·64	Easterly.	Calm.	Clear and cool, cold nights.
December	72	85	60	0·4	Ditto.	Ditto.	Ditto, ditto.

N.B. The above is an average condition of the season for the period under report.

	3. The climate throughout the year may be considered tolerably good. It is dry, with the exception of the monsoon months, and is uninfluenced by artificial causes of any kind likely to be injurious to the health of the troops. No suggestions seem requisite with regard to dress, drill, and exercise. The most unhealthy months are those of May and June, when cholera, fever, and bowel affections prevail. 4. The only climate near more conducive to health than this is that of Belgaum, the head quarter station of the southern division of the army, and distant 75 miles. 5. The services of the members of the committee having been distributed over very many stations in the Bengal, as well as in the Bombay Presidency, little more than opinion approximating to their comparative healthiness or otherwise can be given. As a few of the healthiest, the following may be mentioned in Bombay, Ahmednuggur, Mulligaum, Asseerghur, Kurrachee, Belgaum. The following are generally considered unhealthy, Dhoolia, Baroda, Hyderabad (Sinde), and Aden, in all of which some of the members of the committee have had experience.
III. Sanitary Condition of Station.	1, 2, 3. Map of the station with plans of the station, lines, and pendalls, &c., are transmitted. 4. No permanent accommodation for European troops. 5 to 16. These questions having reference exclusively to European troops; the committee pass to the consideration of No. 17.

KULLADGHEE. BOMBAY.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	17. The immediate neighbourhood of dwellings in cantonment is kept clean by the owners thereof, while all refuse matter in the vicinity of the bazaars and public roads is removed by scavenging carts, and deposited at a considerable distance to leeward of camp. 18. The surface of the cantonment is kept sufficiently free of vegetation, and there are no old walls, thick hedges, &c., interfering with its free ventilation. 19. The health of the permanent residents in the bazaar is generally good, and the site being high, water drains quickly off. Cleanliness is enforced by the bazaar authorities. The bazaar is under the immediate supervision of the staff officer, staff surgeon, and kotwall, who require the occupants of the various houses to keep them and their vicinity clean. The town of Kulladghee excepted, there are no native dwellings, dung heaps, or cesspits, in the neighbourhood of camp. 20. No answer to this question. 21. So few of the permanent residents of the bazaar or the camp followers living therein possess horses, that no defined limit for the purpose of picketing seems to be assigned, the beasts for the most part being allowed to forage for themselves, in the jungle by day, and at night are secured close to the dwellings of their owners. 22, 23. No European troops at this station.
Officers' Quarters.	1. The quarters occupied by officers are not public; they are invariably kept in a state of cleanliness.
IV. HEALTH OF THE TROOPS.	1. The average state of the public health in the station is good, as is also that of the adjoining native population. 2. Cholera, fever (for the most part of a mild type), and small-pox are the prevailing diseases; spleen disease occurs but rarely. 3. The neighbouring native population being almost entirely rural, in tolerably easy circumstances, and the necessaries of life being within the reach of all, and abundant, are the chief causes to which their average state of health may be attributed. 4. The troops at the station are local, with the exception of the 7th regiment native infantry, lately arrived from Bombay, where they suffered considerably from scurvy, and from which they are steadily improving. In point of accommodation sufficient difference does not exist likely to influence health to an appreciable extent. 5. Troops at this station are cantoned. 6. No member of the committee has ever held charge of troops at hill stations. 7 to 18. These questions having reference solely to hill stations, and there being no European troops here, the committee pass to the consideration of No. 19. 19. Soldiers should proceed to India from the age of 18 to 24 years, and land there from November to February. For preserving the health of recruits on first landing in India, I would recommend the following precautions:—Temperance, avoid undue exposure to the sun, wear flannel constantly next the skin, and let the duties as regard drill, &c., be as light as possible during the first four months. 20. It is the opinion of the committee that advantage would accrue in point of health by troops being sent to intermediate stations, whereby acclimation might become gradual. Troops on landing should be sent to hill districts if practicable, but in all instances they should be removed from the coast. 21. Troops are transported from the port to the interior usually for some distance by rail, then by bullock cart, and marching, and by steamers, from port to port. 22. A British soldier should not serve in India longer than 10 years consecutively. 23. It is the opinion that great benefit would arise were medical invaliding boards or committees (whose opinion would be final) appointed in each division. 24. Invalids leaving India for home by the Cape route should do so in November, December, or January.
Diseases.	1. The frequency of parade inspections for the discovery of incipient diseases is regulated by the appearance of scurvy and other ailments. 2. There has been no case of scorbutus at this station. 3. The proportion of hepatic disease usually under treatment among the native troops, is small, for the most part simply congestive and amenable to treatment, though cases do occasionally occur complicated with dysentery and other affections of the bowels. Beyond the means known to advance and preserve the standard of health, there is none which the committee is prepared to recommend for native troops. 4. As the occurrence of dracunculus is usually ascribed to the nature of the water consumed by the men, it would be difficult for the committee to suggest any prophylactic, the adoption of which would not necessarily entail what is beyond the men's reach, *i.e.*, change of water. 5. The proportion of the constantly sick from venereal diseases to the total sick is not more than two per cent. among the native troops. The establishment of lock hospitals would in the opinion of the committee be highly advantageous to the health of the European troops of the army. 6. The following are the diseases from which the troops at this station suffer:— Fevers—Of an intermittent type are prevalent at this station at certain seasons. Dysentery—But rare. Cholera—Is frequently sporadic in the camp. Small-pox—But rarely prevails to a serious extent, the benefits of vaccination being regularly promulgated. Rheumatism—Is not a prevalent disease. The following is the average proportion, taken for five years, which admissions and deaths from the above diseases bear to the total admissions and deaths.

From 1st January 1855 to 31st December 1859.

Diseases.	Total for five Years.		Average of five Years.		Remarks.
	Admitted.	Died.	Admitted.	Died.	
Dysentery - - -	38	—	7·6	—	These returns refer to the 1st Regiment Southern Mahratta Irregular Horse. Average strength at head quarters, 325.
Cholera - - - -	16	9	3·2	1·8	
Small-pox - - -	—	—	—	—	
Rheumatism - - -	59	1	11·8	0·2	

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	7. Great prostration of the vital powers is the nosological character of the more frequent zymotic diseases. These diseases are most prevalent in May and June, and are preceded by deranged electric condition of the atmosphere with frequent suspension of the usual winds. There is no particular prevalence of any of those diseases in certain parts of the bazaar. With regard to the habits of the troops, little can be said, but want of cleanliness and ill-constructed buildings predispose, to some extent, the native population to those diseases. 8. No answer to this question. 9. Small doses of quinine have not been given as a prophylactic against malarial disease at this station. 10. Epidemic diseases being rare here, the committee have nothing to recommend.
X. Field Service.	1. There are no local medical regulations not included in the general presidency regulations. 2. When any doubt exists as to healthiness of position as regards the line of march, bivouacking, camping, &c., the question is disposed of by consultation with the medical officer. 3. There do not exist any peculiar regulations for the preservation of the health of the troops, which are located in permanent and well-ventilated buildings with an abundant supply of water. All suggestions by the medical officer receive ready attention, and he is invariably consulted on the above subjects. 4. It is not in the power of the committee to afford information as to the arrangements adopted in the presidency for field hospitals, ambulances, transport for sick, and hospital supplies, &c.
XI. Statistics of Sickness and Mortality.	1. Kulladghee has been occupied by Madras as well as Bombay troops.

KULLADGHEE.—European Troops.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	Queen's Troops.																					
1858-59	Detachment 8-14 Royal Artillery Detachment H.M. 56th Regiment	135	27	1	—	—	19	—	3	—	30	1	6	—	—	—	153	—	238	2	176·2	1·4
	European Troops in the Indian Army.																					
1857-58	Detachment 3rd Company 1st Battalion Artillery Detachment 2nd Regiment European Light Infantry	29	19	—	—	—	—	—	1	—	14	—	1	—	—	—	23	—	58	—	200·0	—
1858-59	Detachment 2nd Regiment European Light Infantry.	15	7	—	—	—	—	—	—	—	3	—	3	—	—	—	14	—	27	—	180·0	—
	Native Troops.																					
1852-53	Detachment 5th Regiment Native Infantry Detachment 19th ditto ditto	99	25	1	—	—	6	—	—	—	6	—	—	—	—	—	27	—	64	1	64·6	1·0
1853-54	Detachment 5th ditto ditto	48	5	—	—	—	—	—	—	—	—	—	—	—	—	—	7	—	12	—	25·0	—
1857-58	Southern Mahratta Irregular Horse	345	92	1	1	—	2	—	—	—	43	—	3	—	—	—	312	—	453	1	131·1	0·2
1858-59	5th Regiment Native Light Infantry L.W. 15th Regiment Native Infantry Detachment 18th ditto ditto 1st Regiment Southern Mahratta Irregular Horse 2nd ditto ditto	807	234	1	4	—	6	—	4	—	24	1	3	—	—	—	544	—	819	2	101·4	0·2

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, November 9, 1860.

W. C. Coles, Assistant Surgeon,
Secretary.

XII. Hospitals.	There is no general hospital at Kulladghee.
XIII. Burial of the Dead.	1, 2. There is a small burial-ground situate about a quarter of a mile to the south-east of the station, and to the leeward of it, for the interment of the European dead. 3, 4. Refers solely to European troops. There is no native burial-ground within camp limits. 5. The dead of camp followers or bazaar people are disposed of by burning or interment beyond camp limits. 6, 7. No injury occurs to the public health from the present practice, nor are any improvements, in the way of regulation or otherwise in the burial or disposal of the dead, to be suggested.

(Signed) John T. Sanderson, M.D., Assistant-Surgeon,
2nd Regiment of Southern Mahratta Horse.
H. Wilson, M.D., M.R.I.A., Assistant-Surgeon,
1st Regiment Southern Mahratta Horse.

July 1, 1860.

TANNA.
BOMBAY.

TANNA.

Accommodation—Native Troops, Infantry, 315.

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is hilly, but in the neighbourhood of the camp it is flat; two miles to the east and west there are ranges of hills. It is well wooded, the hills on the west being covered with jungle, and there is abundance of water. The sea separates the station from the main land. 2. The elevation of the station above the sea is about 10 feet, but is generally lower than the adjacent country. There is higher and healthier ground adjacent, but no plateau sufficiently large to be occupied by troops. 3. The nearest mountain or table-land is two miles distant. It is 700 or 800 feet above level of station. 4. The water nearest the station is a creek or arm of the sea which separates the station from main land. The vicinity is liable to overflow during the heavy falls of rain in the monsoon There is a nullah or ravine behind the civil lines, which contains putrid salt water and is detrimental to health in the hot season. During the monsoon the salt water is washed into the sea by rain water, the nullah being the bed of a mountain torrent. 5. The station is shut out entirely from westerly breezes by a range of hills on the west. It is surrounded immediately on north-west and south by the suburbs of Tannah, which interfere with free ventilation and the temperature is raised by the buildings being exposed to reflected sun heat. The station is almost shut out from all breezes. 6. The surrounding country is partially cultivated. Artificial irrigation is observed to have an effect on the health of the station, when evaporation is going on, which is injurious to health. Rice is cultivated close up to the station on all sides. Indigo is not cultivated, neither is the preparation of flax or hemp carried on near the station. 7. The town of Tannah immediately surrounds the station, and has a population of 12,000 souls. 8. The geological formation of the hills consists of trap with subsoil of gravel and decomposed trap. The station occupies old ground. 9. Water is usually found about 15 feet below the surface during the dry season, and during the rainy season almost on the surface. 10. The rain-fall or the water from surface springs in the immediate station flows readily away but in the vicinity, which is lower ground, it lies till evaporation takes place. There is higher ground adjacent, the drainage from which passes through the subsoil of the station into the sea. 11. The water supply of the station is derived from wells and tanks. The tanks are open, and contain in surface about 17,000 square yards, they are more or less full, but nearly dry up during the hot season. They contain rank grass and lotus, amphibious animals, and numerous insects. The tank used for drinking purposes is also used for bathing, although there are rules against the same existing, which are not carried out. The tank and wells are liable to pollution by vegetable matter falling into them, but they receive no foul drainage; nuisance and malaria decidedly proceeds from the tanks both within and without the station, the best means of preventing which is to deepen and clean them out of leaves and lotuses. 12. There is one tank and several wells for supplying the station with water. The well water is very good, but the tank water is bad, and altogether the supply is insufficient. If the rain does not fall by the 18th June, there is a great scarcity of water. The water is raised by lotas attached to ropes. A better supply could be obtained by deepening the wells and tanks. 12. There are no other topographical points bearing on the health of the station, except that we consider the station very badly situated, being surrounded with hills on every side, which shut out the sea breeze, and the native town and bazaar being in close proximity to the station. 14. New stations are selected generally by the Quartermaster-General in conjunction with Superintending Surgeon and an engineer: no improvements can be suggested.
II. Climate.	1. The means and instruments available at the station for conducting and registering meteorological observations are a thermometer and rain gauge. 3. The character of the climate is excessively moist, but not variable, the temperature being generally high throughout the year. A moderate number of trees have been planted here and there about the station. There are no canals, the only irrigation influencing the climate are the numerous rice-fields which bound the station on all sides; the atmosphere is not impregnated with dust. The troops being well clothed and sheltered, and living well, the climate has not much influence on their health. The men are drilled for one hour at the time, morning and evening, during the cold weather, and once a day during the hot weather. January, February, and December are healthy months, and April, May, June, and September are unhealthy. The prevailing diseases are cholera, diarrhœa, and fever. 4. There is no district near the station, the climate of which is more conducive to health. 5. With regard to the comparative salubrity of stations at which we have served, Kolapore, Sattara, Poona, Bombay, Kurrachee, Sukkur, Shikarpore, Baroda, Ahmedabad, Deesa Aden, Hyderabad, Belgaum, and Dharwar are good, Kurrachee being the most healthy; Kolapore, Sattara, and Poona the climate is good, Kurrachee very good. Ahmedabad fair, Deesa very good, Aden healthy, Belgaum and Dharwar pleasant, but not healthy, while at Bombay, Sukkur, Shikarpore, Baroda, and Hyderabad the climate is positively injurious.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station, surrounding country, &c. are transmitted. All drains are open unless where an obstacle intervenes, when they are passed under. There are no sewers. 4. The following is a table of particulars regarding barrack accommodation, &c. Date of construction of barrack, 3 erected in 1852–53, 1 in 1840–41, 3 in 1857–58. Total number of pendalls, 7. Total regulation number of non-commissioned officers and men, 315.

References to Subjects and Queries.

Replies.

III. Sanitary Condition of Station—*cont.*

Pendals.	Regulation Number of Men in each Pendal.	Dimensions of Pendal.				Cubic Feet per Man.	Superficial Area of Feet per Man of Floor Space.
		Length.	Breadth.	Height.	Cubic Contents in Feet.		
		Ft.	Ft.				
No. 1	35	116	$31\frac{3}{4}$	5 feet at sides, 12 feet in centre.			
2	35	112	$30\frac{1}{4}$				
3	41	127	32				
4	37	$107\frac{1}{2}$	30				
5	54	$174\frac{1}{4}$	32				
6	31	$92\frac{1}{4}$	30				
7	82	237	31				
			Mean.				
Total	315	966	31	5 to 12	254,541	808	95
Guard Room	—	$32\frac{1}{2}$	$46\frac{1}{2}$	9	—	—	—
Prison Cells	None.	—	—	—	—	—	—

The men sleep on the ground. There are no windows.

5. There are no windows at all to the barracks. There is a verandah all round the buildings about 4 feet wide, but it is not occupied as sleeping quarters by soldiers or other persons. There are no jalousies or jhilmils.
6. The men sleep on the ground.
7. The tents used in camp are double-poled rowties, $29\frac{11}{18}$ superficial feet, and $117\frac{1}{4}$ cubic feet per man, and capable of containing 13 men in each tent.
8. The barracks require no ventilation, the door being nearly always open, and the partitions being nothing but wattle and daub. The ventilation is sufficient to keep the air pure by night as well as by day. There are no means used for cooling the air for barrack rooms.
9. The pendals are raised on wooden posts, between which are wattle and daub partitions. Tents are composed of three-fold dungaree.
10. The floors of the barracks are earthen, raised 1 to $1\frac{1}{2}$ feet above the ground, and admitting of no passage of air beneath.
11. The materials used in the construction of barrcks, &c. are suitable to the climate, and require no improvement. The hospitals and pendals are kept in repair by the executive engineer, and all necessary repairs are generally executed immediately on the requisition being received by him. We suppose the collector is responsible for the general sanitary condition of the station.
12, 13. There are no lavatories, washing-places, or baths for the men, neither are there any cook-houses. The conveniences for washing and drying linen are simply a good tank, a good stone, and a hot sun, the sepoys and dhobies going to whatever tank they prefer.
14, 15. There are no privies or urinals.
16. The natural slope of the ground carries off the water, and there is no artificial drainage. The natural drainage is sufficient for all purposes. No part of the buildings is damp. There are no cesspits, but there is a foul nullah 20 yards behind the quarters occupied by the military.
17. The general state of the surface cleansing within the cantonment and its vicinity is very good; refuse is thrown into the creek, and carried away by the tide.
18. The surface of the cantonment is kept free of vegetation. The town and suburbs interfere with the ventilation of the station.
19. The native bazaar (which is the only one) is managed very well, and is under the regulation of the police, who enforce cleanliness, and perform their duty well. The condition of the native houses near the station is good, but there are dung-heaps within them. A nuisance is experienced in barracks from wind blowing over the native dwellings, which is caused by the close proximity of the town, but there is no method of preventing this.
20. There being no European soldiers at the station, there is no cause for slaughtering animals.
21, 22. There are no stables or picketing grounds at the station.
23. No quarters are provided at the station for married non-commissioned officers or men.

Officers' Quarters.

1. There are no officers' quarters at Tanna.

IV. Health of the Troops.

1. The station, district, and adjoining native population are healthy.
2. The most prevalent diseases among the natives are fevers, chiefly of the quotidian intermittent type, splenic enlargement, and diarrhœa.
3. We attribute the healthiness of the natives to their living well, the town not being overcrowded, the streets broad, and the sanitary state of the station being well looked after by the police.
4. The troops at the station arrived from Bombay on the 14th November 1859. While there they suffered from scurvy, but with the exception of a few cases of scorbutus the men were healthy on their arrival. They have since suffered from quotidian intermittent fever. No one portion of the men's present accommodation is more unhealthy than another.
5. The troops are never camped out at this station.
6, 7. No experience of hill stations.
8. From the great benefit which European troops derive from a residence at hill stations we highly approve of their selection for Europeans.
9 to 16. No experience of hill stations.
17. There is no higher ground near the station which could be advantageously occupied as a hill station.
18. We cannot say wha class of soil is more healthy or unhealthy than others for stations.
19. Soldiers proceeding to India should be from 19 to 20 years of age. They should land there during the months of November, December, January, and February. Cannot say how troops are disposed of on first landing as regards barrack accommodation, clothing, &c., or what precautions are taken for preserving the health of recruits on their arrival in India.

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References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	20. Troops proceeding to India should first be stationed at the Mediterranean or the Cape, and on first landing in this country they should be sent to the hill districts, and gradually accustomed to the climate. 21. The mode of transport of soldiers to the interior is chiefly by land. 22. The number of years a British soldier should serve in India is 20. 23. We have no experience as to the manner of conducting the business of medical boards. 24. Invalids should leave India in February or March so as to arrive home in June.
Diseases.	1. Occasional inspections are made for the discovery of incipient diseases at this station. 2. When the men of the detachment arrived at the station a number of them were suffering from scorbutus, but they have much improved in health since they came here, and are now free from this disease. 3. The sepoys at this station have not suffered from any hepatic affections. 4. Guinea worm is very prevalent amongst the native population, but only one case has been admitted into the military hospital. 5. There have been no cases of venereal diseases under treatment, and sepoys seldom suffer from this affection, so that there is no necessity for the establishment of a lock hospital at this station. 6. The troops at this station suffer from fever of the quotidian intermittent type, of a mild character, which is readily amenable to treatment. Some very severe cases of dysentery have occured amongst the native troops, but most of them yield to local depletion, ipecacuanha, and opium. Tanna and the whole of the surrounding country was visited by a very severe form of cholera in May and June 1860, and a large number of the inhabitants and prisoners in the gaol fell victims to the scourge, but there were no admissions into the detachment hospital, and there are no records in the hospital that would show that the sepoys had ever suffered much from the disease. Small-pox broke out amongst the camp followers in February 1855, but no casualty occurred; the disease has not made its appearance in the lines since. Both the acute and chronic forms of rheumatism came under our observation, and this disease principally occurred with men who had frequently been under treatment with fever. With regard to the proportion which the admissions and deaths from these diseases bear to the total admissions and deaths we can say that during the 7½ months, the present detachment has been stationed here no casualty has occurred, but we are unable to give further information for want of records. 7. There is no peculiar nosological characters of zymotic diseases to be noticed. During the months of April, May, and June cholera and diarrhœa prevail, and a large number of cases of fever are admitted in May, June, September, and October, and their appearance is always accompanied with excessive heat. The sanitary state of the whole town is well looked after by the police, the drainage, water-supply, and ventilation is good, and disease is not more prevalent in one part than another. If the natives would discontinue their filthy habits of bathing, washing clothes, and drinking the water out of the same tank, in my opinion they would suffer less from diseases of this kind. 8. The occupations and duties of the sepoys have but little influence on their health. 9. Quinine has not been tried at the station as a prophylactic against malarious diseases. 10. We have no recommendations to make towards the prevention or mitigation of epidemic disease at the station.
V. INTEMPERANCE.	1. The soldiers at the station are very temperate, and there are no confirmed drunkards. 2. There are no admissions into hospital from disease caused by intemperance. Drunkenness is punishable as an offence. 3 to 11. No answers given to these queries, there being no European soldiers at the station.
VI. DIET.	No information under this head.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The ordinary regulation dress and accoutrements of the Bombay army are worn by the soldiers at this station, and we consider it suitable to the climate here, and cannot suggest any improvements. The present guard dress is a red coat and black linen pantaloons. There are sentry boxes and great coats to protect the men from the rain or sun.
Duties.	1. We have no experience, to suggest as to whether the men should be thoroughly drilled at home, or at some intermediate station before being sent to India. 2. The usual routine of the soldiers' duty is to mount guard every third day, and be drilled about four days in the week, for one hour in the evening (weather permitting) during the monsoon, and if the drill be short a soldier does not suffer from it. The best hours for drills, parades, and marches are in the morning before sunrise, and there are general orders on the subject. The men have upwards of four nights in bed during the week. 3. The guards are mounted at about 250 yards distance from the barracks. There are roll calls morning and evening. Night guards are always injurious to health, and European soldiers ought to have at least four reliefs and native troops three.
VIII. INSTRUCTION AND RECREATION.	No information under this head, the queries applying to Europeans; it is suggested, however, that a talim khana should be provided for the sepoys.
IX. MILITARY PRISONS.	1. There are no military prisons at this station.
X. FIELD SERVICE.	1. There are no local regulations for field medical service. 2. The practical working of the powers of the medical officers as regards the conduct of the line of march of troops, bivouacking, camping, billeting, &c., is very good. 3. The practical operations of the regulations, for encamping the men are very good; on this subject we beg to refer you to page 143, Dep. General Orders, under the head of "Encampment." The medical officer has always the power of suggesting for the information of the commanding officer, and we can recommend no improvements in this respect. 4. Every regiment has its hospital establishment and carriage, the latter consisting of doolies kajavas, and spring carts. The hospital supplies are transported according to the means of carriage the country affords.
XI. STATISTICS OF SICKNESS AND MORTALITY.	No information under this head.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1. A ground plan and a rough marginal sketch of the elevation of the hospital is forwarded with the report. 2. The position of the hospital is within 100 yards or so of the pendalls, and lies N.N.W. of the town and to the west of the civil population. Its site is rather open, and there are no buildings which particularly interfere with the ventilation. The site is generally very healthy there being an absence of malaria from river banks, marshes, nullahs, ditches, water pits, foul ground, or other nuisances. 3. The hospital is well and abundantly supplied with good water. 4. The hospital has no refuse or sewage water and the sweepers remove all impurities. 5. The hospital buildings are constructed 1½ feet above the ground with no passage for air underneath the floors. The roof water sinks into the subsoil, and gradually drains off to the outer drain (mentioned hereafter) the position being slightly elevated. There is no guttering round about the hospital, but it is railed in, and outside the railing enclosures there is a drain, which carries off the rain-fall. The hospital is built of stone and lime, with single roof and walls, which are sufficiently thick to keep it cool, as cool as any building in Tannah can be. There are verandahs on both sides which afford shelter from the sun, their breadth is 8 feet. They are used for the accommodation of the sick when the hospital is crowded. The hospital consists of one ground floor. The following is a table of hospital accommodation :— Date of construction, 14th October 1848. Total number of wards - - 1 Total regulation number of beds - 12

Wards.	Regulation No. of Sick in each Wardr.	Dimensions of Wards.				Cubic Feetper Bed.	Superficial Area in Feet per Bed.	Height of Patients' Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				No.	Height.	Width.
1 Ward - -	12	Ft. 56	Ft. 18½	Ft. 15 in centre 21	Ft. 18,648	1,554	86⅓	Ft. 1½	8	Ft. 4½	Ft. 3½

The hospital is so placed as to receive the full benefit of the prevailing winds. The windows (as shown on plan) open outwards, and the other arrangements are good. The windows are divided into an upper and lower portion, either of which can be open or shut at pleasure.

6. There is no means of ventilation in the wards whatever, except by keeping the doors and windows open, which is quite sufficient for the purpose. There are jalousies or jhilmils attached to the outer verandah weather boards, which can be pulled up or let down at pleasure.
7. There are no artificial means in use for cooling or warming the air admitted into the wards of the hospital.
8. The walls and ceilings of hospital wards are cleansed and lime-washed about once every three months.
9. The privy is to the south-east of the hospital and within 48 feet of it; it is built of stone and lime, with cesspool attached. The night soil is removed by sweepers three or four times a day, and no water is required, each man taking his own lotah.
10. There are no lavatory arrangements for the hospital.
11. The means of bathing for the sick is left for the native troops to arrange themselves.
12. There are no means provided for washing and drying hospital linen.
13. The dispensary is used as a store room, and found to be sufficient.
14. The bedsteads, cots, and bedding in use at the hospital is the common charpoy of the regulation pattern, with four wooden legs, and sides of square wood filled in with tape, but we suggest bedsteads ought to be made of iron, as the wooden ones harbour vermin.
15. The hospital kitchen is to the south of the sick wards. There is no system of dieting, and the natives make their own arrangements.
16. No reply to this query.
17. Each sick man is provided with an attendant when it is found necessary, and there is one orderly attached to the hospital, which we think is quite sufficient.
18. The hospital is a good substantial building, and is well raised from the ground. All the arrangements are good. Epidemic disease, such as hospital gangrene, or pyæmia, have never been known to occur at this hospital.
19. There are no deficiencies or sanitary defects at this hospital, which have come under our notice.
20. A strong fence surrounds the hospital, the enclosure within which is found sufficiently large for the sick and convalescent to take exercise; there are no shaded walks or seats set apart for their use, and they are not found necessary.
21. The wives and children of the sepoys who may be sick are treated in their lines, and no other arrangement could be recommended, neither is it necessary.
22. There are no local hospital regulations enforced at the station.
23. The medical officer has the whole power vested in him in matters appertaining to the sanitary state of the hospital, and when repairs are required he reports to the proper authorities.
24. There are no convalescent wards or hospitals for convalescents, nor would they be of any advantage at this station.

XIII. Burial of the Dead.

1. The burial-ground is in the churchyard, and is situated about the centre of the station, immediately to the north of the native infantry lines.
2. The area of the burial-ground is 1,000 square feet; the subsoil is moorum (gravelly, and of trap detritus); the drainage is efficient, and the ground is carefully kept.
3. The burials at this station are so few that the graves are dug according to convenience, or as the friends of deceased may desire. The depth of a grave is generally from 5 to 8 feet, and the graves are not reopened for second interments. Interments for both European and

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References to Subjects and Queries.	REPLIES.
XIII. Burial of the Dead —*cont.*	native troops take place as soon as all the necessary arrangements can be made which is generally from 20 to 24 hours after death. 4. The graveyard is never offensive, neither can it be, as burials at this station are so few. There are no British troops at the station. 5. With respect to the disposal of the dead of the camp followers or bazaar people, if Hindoos, they are burned; and if Mahomedans, they are buried. 6. No injury to the public health accrues from the present practice. 7. We cannot suggest any improvements in the way of regulation or otherwise in the burial of the dead.

(Signatures) H. J. MUTER, Captain commanding at Tanna.
JOHN H. WHITE, Lieut., Acting Ex. Eng.
J. MENNIE, Acting Civil Surgeon.

August 11, 1860.

DAPOOLEE.

Accommodation—Native Infantry - - - - - 358.

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The station of Dapoolee lies in one of the numerous valleys of the Concan, on the first succession of terraces from the coast to the Western Ghauts, and around it the country bristles with hills of varying height, of rounded outline, and intersected with river or nullah courses. The surrounding country is essentially hilly, always dry after the monsoon, but during the rains in the broader valleys it is swampy. There is but little wood, jungle, or water in the vicinity, but in the Bunn Valley, lying in a north-west direction, and distant about five miles, there is some jungle. 2. The elevation of the camp of Dapoolee is about 600 feet above the level of the sea, and the mean elevation of the Concan is said to be about 100 feet. The immediately adjacent country is of the same elevation as the camp itself. The "Jog" nullah and the "Peera" river or nullah are the nearest water to the station; but these, although called rivers, are only monsoon torrents, and are dry beds in the hot season. At a distance of about two miles west a stream exists all the year, becoming very thready as the monsoon approaches. There are no lakes or marshes in the vicinity. Many of the hills are higher than the site of this station, without having any possible advantage for permanent military purposes. 3. The nearest table land is that of the Deccan; the next is Mahableshwur (considering it as an isolated position). The distance of the Deccan by a circuitous made road, and the ghaut at Koombarlee, is about 38 miles, and its elevation 1,800 to 2,000 feet above the sea. Mahableshwur, a celebrated sanitary hot-weather station, is distant about 40 miles, and stands at an elevation of 3,400 feet above this station. 4. The sea is the nearest large water, being nine miles distant in a course almost due west. The vicinity is not liable to overflow. A deep ravine runs through the station from the south-east to the north-west, and is the bed of the so-called river Peera, dry in the hot season. It can only affect the health in so far that it is the common necessary of the inhabitants and sepoys; but in this respect it is not prejudicial from experience. 5. The station, though surrounded by hills, is open to the winds, which easily pass over them, the south-east end of the station being the most freely exposed. Trees, houses, or walls do not in any material way interfere with the ventilation. The temperature of the station is raised in consequence of the proximity of dry uncovered hills. The station is not exposed to cold or variable winds, nor freely to land winds, but fully to sea breezes. These latter make the climate bearable, but are likely in debilitated constitutions to cause or prolong rheumatism; they do not possess any tonic effect on the constitution. 6. The surrounding country is cultivated in the monsoon. There are no works of irrigation near the station. The cultivation of rice is carried on immediately outside the camp limits, but there is no cultivation of indigo, nor preparation of hemp or flax in the district. 7. There is no large city or town near the station, but a large village named Jalgaon lies close on the south boundary of the camp. Its population is stated at between 3,000 and 4,000. 8. The geological structure of the district is volcanic; trap, with laterite overlying, the laterite hills having generally a rounded outline. The surface is composed of the broken-down laterite or decomposed trap; but laterite enters into all the surface and subsoil. The station occupies new ground and takes its name from a village half a coss to the north. 9. The depth below the surface at which water is found varies according to the locality; in the dry season at from three to 60 feet, and during the rainy season from one foot to 30 or 40 feet. 10. All water, from rain-fall and other sources, flows readily off, and is likewise in the rainy season quickly absorbed by the porous laterite soil. Only in parts does it lie on the surface and evaporate, and this may be easily remedied by drainage. After absorption it does not ooze out at the level of the station. The drainage from the higher ground finds its way by the gradual slopes and furrows to small watercourses, from these to larger ones, and from these again into "karrees" or creeks, and from thence to the sea. 11. The water supply of the station is derived from wells; but there are no tanks within half a mile of the station. The wells are generally so situated as not to be liable to pollution, but the situation of a few of them is such that leaves from overhanging trees may fall in. No foul drainage or other impurities run into them. No nuisance is experienced from the wells. 12. The amount of the water supply of the station varies with the season of the year; it is plentiful to the month of March, up to which time supplies are obtainable from river beds. It is afterwards nearly confined to wells, and these as the hot season draws to a conclusion gradually fail; small springs then afford a meagre supply. The number of wells in use is 77, and the population, excluding the regiment, is estimated at 3,425.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	With respect to the chemical composition of the water, it is slightly ferruginous, but its microscopic characters have not been observed. Its quality is good and by no means injurious to health, and in amount it is sufficient for the wants of the present population. For domestic purposes it is raised simply by a rope and vessel in wells near the surface, and in those deeper by a rope and wheel; for garden purposes it is raised by the Persian wheel. Better water supply might be obtained, but only at great expense, and by the formation of large tanks.
	13. A portion of the camp is situated on the north-east side of the ravine (Peera river), and this place is freely used as a public necessary. There are parts of the station which from their position obtain less ventilation by wind than others, but I do not learn that the health of the people inhabiting them is thereby affected.
	14. New sites for buildings are selected by committees of commanding engineer, and medical officers. The present committee does not possess the requisite amount of information with regard to the formation of new stations to enable it to suggest improvements.
II. Climate.	1. The instruments in use here for conducting meteorological observations are marine barometer, max. and min. regn. thermometer, air thermometer, wet bulb do., dry do., for sun's rays, and rain gauge; but instruments for sunshine, force of wind, &c., are not available. The observations are made four times a day, viz., at sunrise, 10 a.m., 4 p.m., and 10 p.m. There is also a vane for direction of wind.

1859. Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January	29·0	75·62	26·25	87·54	61·29	74·83	71·59	97·83	—	N.W., N.E.	Variable.	General.	Dew at mid. month, nimbi and cumuli and cirri, no storms.
February	29·40	72·93	27·11	89·64	62·53	77·71	73·43	98·89	—	N.W., N.E., S.W.	Gen.char. high.	General.	Dew, but not constant, heavy massive cumuli, cirri, no storms.
March	29·38	81·23	23·94	91·06	68·12	79·89	76·34	102·51	—	N.W., N.E., and S.W., E.	Gen.char. moderate.	Clouded.	Dew not general, cumuli and nimbi form clouds, no storms.
April	29·32	85·67	19·80	93·63	73·83	84·44	80·61	104·86	In. Cts. 0·28	S.W. and N.W.	High and moderate.	Clouded and sunshine.	Dew about 15 days, heavy electric masses, clouds, on 29th, cents 28, rain.
May	29·32	85·69	16·81	92·03	75·22	84·16	81·57	100·45	0·18	S.W. and N.W.	Moderate	Clouded and sunshine.	Dew on 19 days, heavy clouds, and at end of the month elect. dist.
June	29·21	82·88	10·53	85·63	75·10	89·92	74·69	89·60	34 06	S.W.	Monsoon.	Clouded.	Dew on 19 days, nimbi and cumuli, squalls.
July	29·17	82·15	9·65	83·90	74·25	81·01	79·16	87·35	42·81	S.W.	Monsoon.	Clouded.	Dew on 19 days, nimbi and cumuli, squalls.
August	29·24	79·69	5·39	78·32	72·93	78·48	76·17	84·19	34·52	S.W.	Monsoon.	Clouded.	Dew on 19 days, nimbi and cumuli, squalls.
September	29·22	79·13	10·77	83·43	72·66	77·44	76·23	89·56	10·78	S.W., N.E.	Moderate and squally.	A few days sunny.	Dew occasionally, overcast, squally.
October	29·34	80·38	18·97	88·58	69·61	78·90	73·93	99·58	1·12	N.W., N.E.	Brisk.	Sunny.	Dew, morning fogs, generally sunny, light clouds, and overcast, no storms.
November	29·36	81 43	24·63	92·76	68·13	79·72	72·65	100·33	—	N.W., N.E., S.E.	Moderate	Sunny.	Dew on 12 mornings, few clouds, cum. strata; no storms.
December	29·41	75·51	Max. th.	broken.	61·20	73·73	65·93	94·29	—	N.E. and N.W.	Moderate and high.	Sunny.	Dew on 10 mornings, few clouds, cumuli, hazy, no storms.

DAPOOLEE. BOMBAY.

References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. The climate is divided into three seasons; 1st, the cold season, from December to end of February; 2nd, the hot season, from March till June, increasing in heat; and the 3rd or rainy season, from June till October. October and November are close hot months. The moisture and dryness vary with the season; even during the rains, there is great variation as to the hygrometric state of the atmosphere. After the rains, for several months morning mists are frequent. Irrigation does not influence the climate, and there is no amount of dust or other atmospheric admixture affecting the climate. The troops at this station are native invalids, and no kind of diet is prescribed for them. They dress always in the red jacket or tunic on duty, but use themselves light clothing in hot weather, and as warm clothing as they can obtain in the cold and rainy seasons. The cold season is the only one suited to exercise and drills, which should take place in the morning. The clothing should be light in the hot and exhausting season, with thin flannel chest and loin clothing. December, January, February, March, and April are the healthiest months. Part of April, May, October, and November, from their close heat, are enervating. June, July, August, and September are the rainy months, and predispose in the already relaxed constitution to rheumatism and chest affections, where the usual precautions are not taken. 4. There is no healthier district near the station. 5. I have served at the following stations; Poona, Deesa, Mount Aboo, Kaira, Broach, Bhooj, Surat, Kurrachee, Hyderabad, Sukkur, Shikapore, Frontier of Sinde, Jacobabad (Khangur), Lakhana, throughout Northern and Southern Concan, Sattara, Southern Deccan country, and Neemuch. As far as I have been enabled to observe (never having been in charge of British troops), the following have appeared to me healthy stations:—Poona, Deesa, Mount Aboo, Kurrachee, Sattara, and Neemuch. Sukkur and Upper Sinde, Broach, Kaira, and Lower Guzerat, were in general injurious.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Map of the adjacent country, with a plan of the station, &c. are transmitted. 4. Table of hut accommodation. Date of construction of huts, 1848, and some in 1859 and 1860. Total number of huts, 358. There are no troops at present at the station.

Huts.	Regulation Number of Men in each Hut.	Dimensions of Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Feet Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.						Feet.	Feet.
358 - - -	1	18	8	10 to ridge.	1,110	1,110	144	None.	1	1	1
Guard Room - -	24	63½	22	10	19,558	814	58	—	5	4½	3
Prison Cells - -	4	15	22	10	5,280	1,320	82½	—	1	4½	3

5. Each hut or small house used by the sepoys has one opening opposite the door; no verandahs exist.
6. No reply to this query.
7. There are no tents.
8, 9. No means of ventilation are used beyond doors and windows, which are however sufficient for natives. Huts are constructed of sun-dried bricks, covered with tiles.
10. The floors are constructed of beaten earth, raised about one foot from the ground; but there is no passage for air beneath.
11. For native troops the huts are very well adapted, but a little more room and less crowding of families would increase their salubrity. The cantonment public buildings are kept in repair. Native soldiers' huts are not limewashed.
12. There are no lavatories for the men.
13, 14, 15. No reply to these queries.
16. There are no sewers, the natural drainage with open ducts being sufficient. Dampness pervades every building during the monsoon. There are no foul ditches.
17. The general state of surface cleansing is tolerable within the cantonment. It is performed by hand labour, and requires more labour expended on it than is allowed. The refuse manure, &c. is as much as possible carried away to leeward of camp, and in the dry season is always burnt.
18. The surface of the cantonment is kept free of vegetation; there are no old walls, thick hedges, &c. to interfere with the general ventilation.
19. The drainage of the bazaar is like the rest of the station, only required during the rains, and then it is well effected by the sloping character of the place, and the various nullahs. The water supply is tolerably plentiful, and cleanliness attended to as far as possible, but there are few latrines. The crowding is, I am sorry to say, considerable, and unavoidable, but good natural ventilation exists. Five labourers are constantly employed in the cleansing of the streets and lanes, a number quite insufficient. An ample registration is required, and also the numbering and naming of streets, lanes, houses, &c. Vaccination is very imperfectly carried on in consequence of a want of registration. The native houses near the station are of the better class of huts. Dung or dirt heaps are common; and these accumulations are used at the approach of the monsoon for burning in the fields. There are no cesspits, and no nuisance is experienced in the lines from wind blowing over the native dwellings.
20. The only slaughtering that is carried on is that of one or two sheep, and one or two goats daily.
21, 22, 23. No reply to these queries.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.* *Officers'· Quarters.*	1. The condition of the officers' houses is good, and there is sufficient accommodation. Natural drainage alone exists; ventilation is simple, and requires no details. No improvements are suggested.
IV. Health of the Troops.	1. The station, district, and adjoining native population are generally healthy. 2. During the hot and cold seasons few diseases are observed, but in the rainy season diarrhœa, dysentery, and chest complaints are not uncommon. Spleen disease is not often observed; cholera, choleraic diarrhœa, measles, and occasionally small-pox, occur at intervals. 3. The sea breeze tempers the great heat, and to its healthy action is attributable the immunity from general disease among the native population. Such diseases as fever may be attributed to insufficient food, exposure, and hard labour; cholera, measles, and small-pox to unripe fruit, contagion, and unknown causes, chiefly atmospheric. 4. The native veterans of this station come from all the regiments of the line, and from every station in which Bombay troops have been quartered. No portion of the men's present accommodation is more unhealthy than the rest. 5. Troops are not camped out. 6, 7. No experience of hill stations. 8. Hill stations should, whenever available, be used for the location of European troops. 9. I am not aware that healthy troops sent to hill stations contract any disease, nor am I aware that in Indian hill stations there are diseases peculiar to them. 10. No experience of hill stations. 11. The hot season is best adapted for residence in hill stations. 12. No reply to this question. 13. The avoidance of the exposure allowed with impunity at hill stations; a careful attention to dress, bathing, diet, and canteen, are the precautions necessary to protect the health of troops on leaving hill stations for the plains. 14. Short services on the plains with location at hill stations would be most conducive to the health of troops serving in India; occasional change of station in the plains is very requisite for the health and spirits of troops. 15, 16. Cannot say what barrack or hospital accommodation is provided at hill stations, or what range of elevation is most suitable for hill stations. 17. There is no higher ground near this station that could be advantageously occupied as a hill station. 18. I have not observed what particular class of surface and sub-soil is more healthy than others for stations. 19. Soldiers proceeding to India should be about 19 years of age, and should land there in the cold season. Not having served regularly with European troops, the committee cannot say how they are disposed of on first landing; but the precaution of the greatest moment to the recruits on arriving, is the placing them at once at some depôt or spot where the minimum of temptation to dissipation exists, and by giving them, wherever they may be, inducements either of employment or pleasure to remain at their quarters. 20. Troops should be sent direct from the home depôts to India. If hill districts are available it would be as well to send troops to them at once. The constitutions of the men, somewhat deteriorated by the voyage, are soon affected, if occupying hot or vitiated atmospheres, *e.g.*, town barracks. If hill stations are not available they should be sent to stations of well reputed healthiness, especially those at a distance from presidency cities or large towns. 21. In the Bombay presidency troops are conveyed by sea on steamers, or on land by rail, marching, or bullock train. The committee cannot from experience say what additional precautions may be required *en route*. 22. From 15 to 20 years is the length of time a British soldier should serve in India. 23. At stations, conflict of opinion at medical boards as regards invaliding of native troops has not been noticed. 24. Invalids should leave India so as to arrive in England during the earlier summer months.
Diseases.	1. There are no inspection parades for the discovery of incipient diseases at this station. 2. There has been no scorbutus among the troops at this station. 3. Hepatic diseases are not usually under treatment at this station. It is peculiarly free from them. 4. Dracunculus is not noticed much at this station. It occurs in the district, and is there universally attributed to the impure drinking water. No prophylactic is known. Asafœtida is looked upon by the natives and wainds, with favour in the treatment. 5. Syphilis is a disease not observed in the hospital at this station. At European stations, registers of the females of this class, with weekly examinations of their persons, and a lock hospital, seem precautions necessary for diminishing the growing evil of this disease among soldiers. 6. The troops suffer from quotidian intermittent fever and chronic rheumatism. Mortality does not take place from the above diseases. In 1858, the admissions from fever were 62, and from rheumatism 25. The proportion of admissions from the former disease to the total admissions was 28·18, and from the latter disease 11·36. 7. Intermittent fever consists of a paroxysm divided into three stages, the cold, hot, and sweating, following in regular succession, and terminating in a complete subsidence of symptoms, and, save a certain languor, return to health. After an interval in the quotidian form of about 24 hours, unless prevented, the fever returns, and runs the course of stages over again. It is generally here uncomplicated, and quickly amenable only to quinine. It occurs chiefly in the cold and hot seasons, strong sea winds acting on the enervated constitutions, especially when the person is profusely sweating. It is chiefly observed directly on the sea coast, not so much so inland. This disease does not frequently show itself in the bazaar or station. The sepoys generally contract fever on their outposts, and come to the station for treatment. The natives confine themselves much in their small close dwellings, which are generally

DAPOOLEE. BOMBAY.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	insufficiently ventilated. Sleeping in the open air, thin clothing, hard toil, and insufficient food, are predisposing causes amongst the natives to the reception of malarious poison. Intermittent fever is very little observed among the European inhabitants.
	8. The soldiers on the march, and in the field, when exposed to the action of malaria, must necessarily be liable to intermittent fever.
	9. Quinine is decidedly prophylactic against malarial diseases, though not tried in that character at this station.
	10. Ague does not appear to take its rise at this station, or at least, rarely. Bancote or Fort Victoria ought to be abandoned as a station, as hardly a civil native servant, policeman, or soldier ever escapes without ague, even after a short residence. It is about 15 miles from this station, situated on the sea, at the mouth of a creek, and is the station of a native magistrate and his court.
V. INTEMPERANCE.	1. The sepoys are temperate as a class, and no confirmed drunkards are known.
	2. There have been no admissions into hospital from diseases caused either directly or indirectly by intemperance. Drunkenness is punished as an offence.
	3. Distilled spirits are sold at the bazaar; but the quality, and amount consumed by each man per diem, cannot be ascertained.
	4. The consumption of spirits by troops is injurious to health, except when rendered requisite as a stimulant after fatigue or during toilsome work. They are not conducive to efficiency or discipline.
	5. It would be beneficial to restrict the use of spirituous liquors as part of the ration, and certainly some restrictive measures ought to be adopted concerning the sale of liquors in bazaars.
	6. Good malt liquor used dietetically is shown by all experience to be superior in its action to wine and spirituous liquors.
	7. The influence of coffee, tea, lemonade, soda water, and similar drinks, on health, efficiency, and discipline, as compared with the use of ardent and malt liquors, must be good. This answer is given on the supposition that a free use is implied.
	8. As a general rule, restriction, instead of suppression of spirit, would appear to be sufficient. Were beer of a good quality supplied, the habit of spirit drinking would fall quickly into disuse.
	9, 10. It would be very beneficial in prohibiting the sale of spirituous liquors in the canteens to permit only tea, coffee, beer, &c., to be sold to the troops. No recommendations to make on these points.
	11. There are no bazaar regulations with respect to European troops at this station.
VI. DIET.	1 to 4. No reply to these queries.
	5. At this station vegetable gardens could be easily established, and they would be healthful and advantageous.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress consists of red tunic, red shell, black cloth trousers, black drill trousers, Kilmarnock cap with white cover, highlow shoes, overcoat, and white trousers. The accoutrements are—musket bayonet, ammunition pouch, cross belt, waist belt, percussion pouch, knapsack, and sling belt. The dress used by the men at this station appears all that could be desired. We cannot suggest improvement in the present style and composition of dress used. Every necessary precaution seems to be taken to ward off the effects of sun heat, night air, and wet. At this station there are sentry boxes. The protection on guard consists of the overcoat, and the sentry ground is the verandah of the guard-house during the heat of the day and in heavy rain.
Duties.	1. The men should be thoroughly drilled at home before being sent to India.
	2. The old sepoys are not drilled. The routine of duties is, guard-mounting, guards inspection parades weekly, muster parades monthly, occasional parades, anniversaries, to hear certain orders read, &c., occasional treasure guards, and the outposts supplied by the veteran battalion guarding the local treasuries. In this climate the mornings in the cold season are the best for drills, parades, and marches. The average number of nights the men had in bed during the week for the month of May 1860, was six.
	3. Guards are mounted close to the lines, and last for 24 hours. Sentries perform their guard for two hours; there are three reliefs. There are roll call parades twice in the 24 hours. The night guards are not observed to be detrimental.
VIII. INSTRUCTION AND RECREATION.	1, 2, 3. There is a native regimental school, but there are no other means of instruction and recreation.
	4. There is not sufficient shade from trees and other means to enable the men to take exercise without injury to health during the day.
IX. MILITARY PRISONS.	1. There are no military prisons or cells at this station.
X. FIELD SERVICE.	1. There are no local regulations for field medical service.
	2. The powers of medical officers on the line of march are, I believe, confined to suggesting to officers commanding what they may consider necessary as affecting or likely to affect the health of the soldiers, their comfort, &c.
	3. Dapoolee being a small out of the way station, and never visited by troops, the regulations in force for preserving the health of troops, as to the selection of camping grounds, &c., are simply confined to attention to cleanliness, cutting down exuberant or rank vegetation, &c. Whenever the medical officer suggests any necessary change or work, as far as the means are at hand, such change or work is always carried out.

References to Subjects and Queries.	Replies.
X. Field Service—*cont.*	4. The regulations for field hospitals, &c. in force, are those of the Medical Code and those in Jameson's Code. Sites for field hospitals are selected by the commanding officer and senior medical officer. Medicine, diet, and comforts are provided by the commissariat. Doolies, and sick carriages of other kinds, are used to convey the wounded. In action advantage is taken of the close vicinity of villages to form shelter for the wounded.
XI. Statistics of Sickness and Mortality.	DAPOOLEE.

NATIVE TROOPS.

Years.	CORPS.	Strength.	Fever.		Erup-tive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epi-demic Cholera.		All other Dis-eases.		Total.		Ratio per Cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	Native Veteran Battalion - -	315	22	—	—	—	4	1	—	—	16	4	2	—	1	—	59	1	104	6	33·1	1·9
1851-52	Ditto ditto - -	369	27	—	—	—	14	1	2	1	8	1	1	—	1	—	111	1	164	5	44·4	1·3
1852-53	Ditto ditto - -	358	26	—	1	—	13	1	3	1	11	—	2	1	—	—	80	2	136	5	37·9	1·3
1853-54	Ditto ditto - -	347	29	1	1	—	4	—	1	—	7	3	1	—	—	—	72	1	115	5	33·1	1·4
1854-55	Ditto ditto - -	333	38	—	1	—	15	—	—	—	17	1	4	—	—	—	115	1	190	2	57·0	0·6
1855-56	Ditto ditto - -	322	39	—	—	—	9	—	—	—	12	3	3	—	—	—	131	3	194	6	60·2	1·8
1856-57	Ditto ditto - -	383	48	3	—	—	13	2	1	—	21	2	2	1	—	—	154	5	239	13	62·4	3·4
1857-58	Ditto ditto - -	408	45	2	3	—	5	1	1	1	21	4	9	—	—	—	87	4	171	12	34·3	2·4
1858-59	Ditto ditto - -	645	78	5	1	—	17	3	—	—	32	—	13	—	—	—	149	4	290	12	44·9	1·8
1859-60	Ditto ditto - -	596	88	2	—	—	18	1	1	—	19	—	6	2	—	—	109	1	241	6	40·4	1·0

By order of the Acting Principal Inspector-General, Medical Department,

Office of the Principal Inspector-General, Medical Department,
Bombay, 29th September 1860.

W. C. Coles,
Assistant Surgeon, Secretary.

XII. Hospitals.

1, 2. The hospital is situated with reference to the lines of the sepoys to the north, and a little west. The Jog river runs between them and is crossed by a large bridge now broken and dangerous. The building is to the north of the bazaar, which is divided into two sections by the Jog. To the north of the hospital is a small hill, which excludes winds from that quarter. There are high trees about, but not close; affording a grateful shade, and not impeding access of winds. The site might be better and more elevated, as the hospital lies almost at the base of one of the hills, just sufficiently however on its rise to allow free running off of water. There is no foul ground near, but there is a large water pit to the north-west, filled in the rainy season, but not productive of malaria. This water pit cannot be dignified by the name of a tank.

3. There are two wells in the compound or hospital enclosure, the water of which is good and plentiful, until the close of the hot season. There is a plentiful spring supply near the hospital; there are no present means for improving the same.

4. There is no artificial drainage for removing refuse water and impurities.

5. The hospital is raised from the adjacent ground; it has no upper story or wards. There is no perflation of air underneath the floor, which is composed of hard beaten earth, cow-dunged every week. The roof water runs off, the position of the hospital being on an incline, and some of the water sinks into the subsoil. The guttering is made annually just before the rains, and is sufficient for every purpose. The hospital is built of laterite stone, with lime plaster over it. The walls are thick and single; the roof is of tiles and double, and both are sufficiently thick to keep the hospital cool. The single ward, of which each building of the hospital consists, is surrounded by a verandah eight feet wide. It is closed by glass windows to the west, and by jhaps to the east, affording perfect shelter from the sun's rays. The northern end of each verandah is set apart for a dispensary. They are occasionally used for the accommodation of sick, convalescents, and others. The hospital consists of one flat only.

Date of construction not ascertained. One ward in each wing.

Total regulation number of beds, 5 per cent. to strength.

Wards or Hospital Huts.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.					Feet.	Feet.
No. 1 - -	30	95	22	14 to beam.	37,620	1,250	68	—	15	6	3
„ 2 - -	30	95	22	14 to beam.	37,620	1,250	68	—	15	6	3

The hospital does not receive the full benefit of the prevailing wind, but by a valley between the two hills facing the north-west it is enabled to receive the wind from that quarter to a certain extent. To the south-west a portion of the bazaar interferes, but notwithstanding these defects of locality it is well ventilated. The windows are casements, and well adapted for ventilation, and with the doors, are the only means for that purpose. There are no jalousies.

7, 8. There are no means for cooling or warming the hospital. The wards are cleansed and lime-washed once a quarter.

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References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	9. The privies are situated to the right rear or north-east of the hospital ward, and are 75 feet distant, but connected by a roofed passage, which is entirely open on both sides to admit a current of air. They consist of seats or openings on the usual native plan. The filth is received in an open trough or drain, which is constantly cleaned from the outside by sweepers. The sweepers obtain access to the drain by means of small doors or openings in the wall, under and corresponding to each seat. The privies are not drained or supplied with water; all cleansing is done by sweepers. There are no cesspits; the surface below the privies is level, and by care they are never allowed to be offensive. 10. There are no lavatory arrangements. An apparatus is built for heating water, and a bath room is attached to each ward; they are never used by native sick. 11. The native sick, when their diseases do not preclude their doing so, bathe by throwing the water, hot or cold, over their nude persons. Except in cases requiring it their custom is not interfered with. 12. Hospital linen is washed, &c. by a dhobie or washerman, forming one of the hospital establishment. The means are quite sufficient. 13. There is no storage, the clothing is kept in a clothing chest. 14. The bedsteads consist of a wooden framework, laced with broad cotton tape, taken off and washed after each patient is discharged. It appears to me, as bugs infest these wooden cots, that iron-framed ones would be an improvement. Native sick use their own bedding. 15. There are two cook-rooms for native sick (for castes) to each wing. They are simple, and have no apparatus. The native sick either cook for themselves or the Brahmin cook, one of the hospital establishment, cooks for them. 16. There are no diet tables for native sick. Since writing the above the corps, "native veteran battalion," has been disbanded; no forms are consequently forwarded. 17. An orderly selected from the corps is always in attendance at the hospital, and any sick sepoy, if extremely ill, is always permitted to have a comrade to be with him, and attend to all his minor wants. 18. I consider the sanitary state of the hospital as good; no epidemic disease, hospital gangrene, or pyæmia have appeared in its wards. 19. I would suggest the fixing in of windows or casements, glazed, throughout the hospital, and the building of a separate ward for serious cases. This latter appears to me to be a great want in all regimental hospitals. 20. There is a large sized enclosure, or compound, which might easily be made comfortable for the exercise of convalescents. Native sick, however, seldom desire to be seen outside. The compound is well shaded. 21. The sepoys' wives and families are attended to when they visit hospital, and are attended at their houses, if willing, which they seldom are. The present arrangements are satisfactory. 22. There are no special hospital regulations not included in the General Presidency Medical Regulations. 23. With reference to peculiar repairs of hospital, these are carried out under the sanction of the superintending surgeon, at his or the medical officer's suggestion. With regard to medical comforts within the hospital, stations, camps, and on the march, the medical officer directs the supply of whatever may be required, subject to the pre or past sanction of the superintending surgeon. General repairs are carried on annually by the officer in charge of public buildings. 24. There are no convalescent wards or hospital, nor does there seem for native soldiers any necessity for such.
XIII. BURIAL OF THE DEAD.	1, 2. The burial ground for European residents is within the station, and is situated on the northern side of the camp and to the west of the hospital. The prevailing winds do not blow fairly over it toward the station. It is well situated on a slope, enclosed by a high wall, and its area is 9,600. The soil and subsoil is decomposed laterite, and all water runs off quickly. It is not known, however, what effect the soil has on decomposition. The ground is not particularly attended to. 3. At present space is not apparently an object, the interval between each grave being from 6 to 10 and 12 feet, and the depth from 6 to 7 feet and more. Graves are never reopened. Interment is compulsory at ordinary times from 12 to 16 hours after death. Native troops bury their dead or burn the bodies. The Mussulman burial ground is to the north of the European one; the Mahratta and other castes are situated to the east of the camp. Natives are buried in a more superficial manner, as a general rule, though many good tombs are erected by them. 4. The graveyard is never offensive. 5, 6, 7. The dead of camp followers or bazaar people are buried in the burial ground of their castes. No injury accrues to the public health from the present practice of disposal of the dead, and no improvements are suggested.

(Signed) ALBANY TROWARD, Lieut.-Col.
Commanding at Dapoolee.
T. B. JOHNSTONE, M.D.,
Surgeon.
M. K. KENNEDY, Captain,
Executive Engineer.

21st August 1860.

DHOOLIA.

Accommodation.—Native troops { Officers - - - - - 8; Non-commissioned officers - - 20; Rank and file - - - - 344

References to Subjects and Queries.	Replies.
I. Topography.	1. The surrounding country is partially cultivated. It is a valley 9 miles in width and 20 in length, divided by the Panjur river in two unequal portions. It is flat, with a low range of hills on the north and south-west. The river Panjur rises from west to east, skirting the northern side of the station. The land not under cultivation is covered with low jungle.
	2. The elevation of the station above the sea is about 1,000 feet, but is on a level with the adjacent country. It is about 30 feet above the nearest water. There is no higher or healthier ground adjoining the station.
	3. The nearest high land is the hill fort of Galna, which is 24 miles distant; its height above the station is about 700 feet. The table mountain of Torum Mal is situated 90 miles north of Dhoolia. Its height above the sea is 4,304 feet.
	The following is a copy of a report on this mountain:—
	"To Alexander Elphinstone, Esq., Collector and Magistrate, Khandeish.
	"Sir,
	"With reference to your endorsement, No. 334 of 1849, dated the 23d ultimo, forwarding the copy of a correspondence relating to a settlement of the feud between the Bheels of the Burwanee state, and Koshia, Naig of Sinde, in the Akraum Purgunnah, and desiring me, with reference to Lieutenant Evans' remarks on Torum Mal, contained in the above correspondence, to avail myself of every opportunity that may present itself of acquiring information of the climate and salubrity of that place, I have the honour to state that I have since visited Torum Mal, and that the result of my observations is as follows:—
	"2. Torum Mal is situated in the heart of the Suthpoora mountains, and forms the most elevated plateau of the whole range. It is in the Akraum Purgunnah, about 40 miles north-east from Shada, the chief town in the Sultanpoor talooka, and the nearest place from which supplies are procurable. Its distance from Mhow, *viâ* Chikulder, is about 140 miles. As far as Chikulder, the road is very good; but from the latter place to Torum Mal, a distance of about 60 miles, it is a mere footpath, through dense jungle, and a very mountainous country. The distance from Baroda, *viâ* Sagbarra and Shada, is about 150 miles; from Surat, *viâ* Nowapoor, Nundoorbar, and Shada, about 160 miles; from Dhoolia, 90 miles; and from Mulligaum, *viâ* Dhoolia, 120 miles. All these roads are very good and practicable for wheeled carriages to within about 20 miles of the summit of Torum Mal.
	"3. The table land of Torum Mal forms an irregular plateau, about 20 miles in circumference. Its surface, however, is much broken by deep wooded ravines, and by irregular-shaped hills, rising from 300 to 600 feet above the general level. Towards the north-east end of this table land are two lakes, the upper one of which is between 2 and 3 miles in circumference. Its water is perfectly clear, the bottom being composed of sand and loose stones. I ascertained the depth of the water in the centre to be 36 feet; on the east side, a few yards from the bank, 31 feet; and on the west side, 27 feet. It contains no alligators nor fish, and the inhabitants say that fish put into it invariably die; but it contains a great quantity of a small species of shrimp, of which the Bheels take considerable quantities for sale to the neighbouring towns in the west of Khandeish; its surface is covered with different species of wild fowl.
	"4. This upper lake is partly artificial, the east side being formed by a vellard extending across the valley at its gorge. The natives, considering this vellard beyond the power of human beings, ascribe its construction to Goorucknath, the presiding deity of the place; and from its immense solidity and extent it would certainly be considered an extraordinary work in any age and country. I ascertained by measurement its length to be 440 yards, its breadth at the base 98 feet, ditto at the surface 28 feet, and height 18 feet. A passage has been left at the south end of this vellard for the discharge of the superfluous water of the lake, and a channel cut to conduct it to the lower one, which is much smaller than the upper, and is said to sometimes dry up in the hot season. From this lower lake a broad channel has been cut for a considerable distance, which conducts the water over a perpendicular fall between 500 and 600 feet high into the valley below.
	"5. The sides of the vellard of the upper lake are thickly shaded by wide-spreading trees of the ficus Indica, ficus religiosa, calyptranthes jambolana, &c., which also shade a great part of its upper surface, which being, as before stated, 28 feet broad, affords ample space for tents or small bungalows, and as a westerly wind prevails almost without change during the hot months, tents on this vellard receiving the breeze directly across the lake are kept very cool the whole day.
	"6. The surface of the lake is about 400 feet below the groups of hills which border it on the south and south-west sides. The hills and plains being thickly studded with groups of large spreading carunda bushes, the toorum (a tall shrub bearing a sweet berry, peculiar to these hills), the wild mango, the ficus religiosa, the calyptranthes jambolana, and many others, give the landscape, at the dryest season, a picturesque verdant appearance, although from the habit the Bheels have of setting fire to the grass every season, the green jungle is not so continuous as on the Mahableshwur hills.
	"7. I regret that I was unprovided with a barometer to enable me to fix the altitude of this plateau correctly; the boiling point of water with thermometer immersed gives an altitude of 4,304 feet above the sea level to the lake, and 5,434 feet to the hills, about a mile and a half to the south-east of the lake, and this I think will be found to be nearly the correct altitude.
	"8. I noted the variation of the thermometer eight times daily during my stay, and although this was during the hottest period of the year, and I was living in a small rowtee open to

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References to Subjects and Queries.	Replies.
I. Topography—*cont.*	the S.W. and N.E., its greatest range was 89° and least range 66°, the mean temperature being 77°, and the daily range of variation being about 16°. During this time the thermometer in a tent under shade, with wet kus tatties, in the plains ranged from 88° to 105° daily. "9. There are about 40 Bheel families dwelling on the hill. They are scattered about in hamlets of five or six huts each, and rear a great number of cattle in the rich pastures of the lower table land. They also cultivate small patches of wheat, Indian corn, grain, tor mor (a species of rice), bhurtee, &c. Each family only cultivates enough to suffice for its own wants, and therefore a great portion of the richest land is left uncultivated. The soil above the upper lake is a rich black alluvial deposit, and on the higher plateaux it is a rich ferruginous clay, which would doubtless produce good crops of potatoes and wheat. The huts of the Bheel inhabitants are strongly constructed of interlaced bamboos, thatched with a species of coarse grass, about 10 feet in height, which grows in profusion on the sides of the hills. They are in the habit of descending to the markets of Tulloda and Shada, situated in the Sultanpoor talooka, and they carry down gums, lac, honey, bees-wax, dye-woods, charolee (a species of sweet nut), &c., which they exchange for salt, spices, cloths, iron, &c. They are a very quiet, inoffensive, timid people, very different from the Bheels in the plains. Their head man is Goorkhia Naik, a fine old man, who has often rendered good service in assisting in the apprehension of desperate characters who have taken refuge in these remote fastnesses. "10. A juttra takes place annually at Torum Mal, in the month of January, in honour of Gooruknath; it had been discontinued until within the last few years, owing to the number of robbers who infested the jungles below; it is now attended by between 200 and 300 persons chiefly from the west of Khandeish. "11. Remains of stone and brick buildings are found scattered all over the hills, and a substantial stone wall varying from 10 to 15 feet in thickness has also been carried round the hills for many miles. It has been defended by round towers of most solid construction, and each of the three passes leading up to the table land has been fortified by extensive works. All these are ascribed by the natives to the period of the Gowlee Raj, or Shepherd kings, to whom are also ascribed all the works in the west of Khandeish considered beyond the powers of the present race of inhabitants. These walls and fortifications are composed of blocks of stone, piled up without any mortar or chunam being used. The outward front is perfectly smooth, and this peculiarity of construction will be found in all works attributed to the period of the Gowlee Raj, as it also distinguishes all Etruscan walls in the ancient cities of Italy. There is also a second or inner wall which appears to have been constructed at a later date, probably after the ruin of the original fortification, and was intended to prevent the ingress of wild beasts, and to keep cattle from straying. All these ruins tend to show that at some early period a very considerable population was located here. "12. There are three approaches to Torum Mal, one leading from Khandeish, one from Burwan, and the third from Sinde and the Nurbudda. There is also a difficult footpath to Dhergaum on the Khandesh side, The road is very good for the first 20 miles from Shada, but for the last 20, from the Bheel village of Chirlee, it consists of a succession of steep ascents and descents. Tattoos with light loads can ascend, and the Banians from Shada bring up their supplies on donkeys; the road might be made much easier at a small expense. The pass leading to Sinde and the Nurbudda, which would be the road for people coming from Mhow and Mundlassir, is also very steep and difficult for about three coss. The ascent by the Hiwassea gate from the direction of Burwan is the most easily surmounted by laden cattle. "13. The Bheels of Torum Mal appear very healthy. They state that there is no prevalent sickness during the rainy season, but that a large species of fly with which these hills abound is very troublesome to both men and cattle. Tigers are seldom heard of above the passes, although they are numerous in the plains below, and during my stay I did not observe a single noxious reptile or insect of any sort. "14. Game is plentiful in the hills, and peacocks, jungle fowl, the grey partridge, quails, wild ducks, hares, wild cats, jackals, foxes, and bears are pretty numerous. The latter appear to ascend the table land during the night to feed off the wild fruits and descend to the valley in the morning. The bison or Bos Ganem, which abounds in hills further west towards Dhergaum, is said by the Bheels to ascend to the table lands during the rains, but never remains during the dry season. Antelopes and the civet cat are also found in the hills, and the Meelgae and genus Cervus (the Sambee) in the valleys around. "15. The geological formation of the hills is composed of hard red sandstone, iron-stone, and masses of trap rock. On the east side scarped masses of bare basaltic rocks of a red colour rise perpendicularly to a height varying from 400 to 600 feet. The deep valleys below are concealed with thick jungle, and abound in peacocks and jungle fowl. From the lofty scarped projections, which on this side jut far out into the ravines, most extensive and romantic views are obtained over a vast extent of mountainous country towards the Nurbudda. "16. A great many trees and shrubs unknown to the plains are found on these hills; several produce edible fruits and berries, which form a considerable part of the food of the Bheels inhabitants, and several produce red and yellow dyes, which they carry to the neighbouring markets for sale. A variety of creeping plants entwine the branches of the largest trees, whilst mosses and lichens, the parasitic orchis, and viscum apontiacies strongly resembling the misletoe of Europe, tend to show the temperate climate compared with that of the low country. "17. Most of the inhabitants of this part of the Suthpoora range are a peculiar class of people called 'Panria.' Although commonly supposed to be Bheels, and classed as such, they deny all affinity with the latter, and will neither eat nor associate with them. They worship 'Waghdeo,' or the tiger demon; they do not eat the flesh of swine or cows, and their manners and customs are quite different from those of the Bheels tribes; they speak a peculiar language, are very quiet and inoffensive, robbery and plunder being almost unheard of amongst them. Most of them have settled in these hills during the last few years, having immigrated from native states bordering the Nurbudda. In the Akranee Purgunna the number of these settlers now amounts to 11,268 souls; five years ago the number was 2,570 souls; they pay to Government for the land they cultivate a sum of about 2,769 rupees annually. "18. There can, I imagine, be no question as to the salubrity of Torum Mal during the hot season, and that its invigorating climate would be a most beneficial change from the depressing heats of the plains, although the thermometer during this season averages

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	about 20° lower than it does in the plains, yet the elasticity of the atmosphere at this height, and the vicinity of a fine sheet of water, cause the climate to be still more agreeable to the feelings than the degree of temperature would indicate; the only question therefore is, whether people would consider it worth the trouble to traverse the wild mountainous country by which Torum Mal is on every side surrounded, for the purpose of enjoying a temporary sojourn on its summit. (Signed) "C. P. Rigby, Lieutenant "Camp at Shada, 28th April, 1849. Western Bheel Agent."

Register of Thermometer at Torum Mal noted in a small Rowtee open to the South-west and North-east.

Date.	At Sunrise.	At 9 A.M.	Midday.	3 P.M.	Sunset.	9 P.M.	Midnight.	3 A.M.	Mean of 24 Hours.	Greatest Variation.	Remarks.
	°	°	°	°	°	°	°	°	°	°	
April 15 -	68	75	82	85	80	77	74	66	75	19	Steady cool breeze from the N.W. Cold westerly wind at night.
„ 16 -	69	77	83	86	84	79	76	66	77	20	Clear sky; very calm. At about 2 p.m. cool westerly breeze set in.
„ 17 -	69	83	89	89	86	81	78	67	80	22	Cloudy weather and calm, no wind all day.
„ 18 -	74	82	87	89	84	80	79	78	81	15	Cloudy weather, with light breeze at intervals. Heavy clouds at night, and slight rain.
„ 19 -	74	75	84	84	82	80	78	77	79	10	Clear sky, with fresh breeze from N.W. at intervals, at night cloudy.
„ 20 -	70	74	82	85	83	80	79	73	78	15	Cloudy; no wind; a slight shower of rain about 8 a.m.
„ 21 -	72	80	83	88	84	82	80	70	79	18	Still cloudy morning; occasional breezes from the west after midday.
„ 22 -	69	82	85	86	83	78	80	70	79	17	Cloudy sky, with cool breeze after midday from the west.
„ 23 -	72	80	84	86	80	78	70	74	78	16	Cool breeze blowing from the S.W. all day; cloudy sky.
„ 24 -	68	72	81	82	80	75	70	70	74	14	Cold westerly wind blowing day and night; clear sky.
„ 25 -	67	70	80	82	79	74	70	68	74	15	Cold westerly wind all day and night; clear sky.

(Signed) C. P. Rigby, Lieut., W. B. Agent.

List of the principal Trees and Plants found in Torum Mal and the neighbouring Hills.

Names of Trees and Plants.	Uses to which applied.
1. Ficus Indica - - - -	—
2. Ficus religiosa - - -	Produces gum and the coccus lacca.
3. Mimosa chanda - - -	Yields a resinous gum.
4. Butra frondosa (Sans. Pullus) -	Its flowers used as a yellow dye, and its fruit as a purgative; yields gum.
5. Zizyphus Albens (Sans. Tourn) -	Its fruit is greatly prized by the Bheels; it is peculiar to Torum Mal.
6. Carissa carondas - - -	Its fruit is used as a pickle.
7. Ficus glomerata - - -	Its fruit is used as food; its wood affords good timber.
8. Tamarindus Indica - - -	Ditto Ditto.
9. Bassia latifolia (Sans. Madbura) -	Liquor is distilled from its flowers, which are also eaten when dried.
10. Zyzyphus jujuba - - -	Its fruit eaten as food; good hard wood.
11. Dispyrs glutinosa - - -	Ditto Ditto.
12. Teroura Elephantum - - -	Yields a gum.
13. Butra superba - - -	A yellow dye and gum.
14. Teeton grandis - - -	—
15. Khakur (native name) - -	Its fruit used as a pickle.
16. Calyptranthes jambolana - -	Timber and fruit tree.
17. Terminalia tomentosa - -	Its fruits used medicinally.
18. Zizyphus napica - - -	An edible berry.
19. Cordia latifolia - - -	A fruit tree.
20. Mimosa catechu - - -	Yields a gum which is used in dyes, and in making cheenand.
21. Grislea tomentosa - - -	Used as a dye.
22. Chirongia sapida - - -	Its nuts are much prized; used in confectionery, emulsions, &c.
23. Mangifera Indica - - -	—
24. Spondeas mangifera - - -	—
25. Dalbergia oojernsis - - -	Bark used in tanning.
26. Phyllanthus emblica - - -	Medicinal; its fruit used as a pickle.
27. Erytherua fulgens - - -	—
28. Dhamun (native name) - -	Good timber; its fruit is eaten.
29. Koosum (ditto) - - -	Yields a red dye.
30. Sapindus emarginatus (Soap tree) -	Its fruit used as a substitute for a soap, &c.
31. Ginlandina moringa - - -	Its flower is used as a vegetable, its bark as a medicine.
32. Hibiscus canambus - - -	Ropes made from its fibrous integuments, and oil expressed from its seeds.
33. Mimosa Sirisha - - -	Timber tree.

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References to Subjects and Queries.	Replies.

I. Topography—*cont.*

"True copy.—Original sent to Government on the 9th May 1859."
(Signed) R. R. Powell, Major, Commanding at Dhoolia.

"Note from Dr. Knapp to Mr. Elphinstone.

"I heard from Rigby the other day; he sent me the observations which he had made on the boiling point of water at Toorum Mal for me to work out the height from Colonel Sykes' table; from which it appears that the level of the lake is 4,304 feet above that of the sea, and that of the summit of a hill about 1½ mile to the southward of the lake, 5,434 feet. This is higher than any part of the Mahableshwur hills, the general level of which is said to be 4,500 feet, and the highest point 4,700. I very much regret not having visited Toorum Mal, particularly as I now find that I could have had even a month's leave from the Brigadier. However, I must look forward to another opportunity, which perhaps may occur, when I may have the pleasure of visiting it with you."

"True extract.
(Signed) "A. ELPHINSTONE,
"Collector and Magistrate."

"True copies.—(Signed) R. R. Powell, Major commanding at Dhoolia."

4. The river Panjar skirts the north of the station, running east and west, but the vicinity is not liable to overflow of water. There is no broken ground to any serious extent.
5. The station is open, and would be freely exposed to winds, if not so encumbered with trees, hedges, and gardens. The temperature of the station is not raised by reflected sun heat. It is exposed to north-west and occasionally to north and north-east winds in December, January, and February, veering to west in March and south-west with monsoon.
6. The surrounding country is partially cultivated. A small aqueduct passes through the station, running parallel to the river; irrigation, however, is too insignificant, and the fields too distant to have any effect on health. There is no restriction as to rice cultivation, but it is cultivated at a distance, and cannot affect the station. Neither indigo nor flax is cultivated near the station.
7. The town of Dhoolia adjoins the station.
8. The surface of the district is black soil, with a subsoil of moorum. The station occupies new ground.
9. Water is found during the dry season at about 30 feet below the surface, and during the wet season at a depth of 23 feet.
10. The rain-fall sinks through the surface into the moorum subsoil, and so speedily drains off. No drainage from higher ground passes into the subsoil of the station.
11. The water supply is obtained from rivers and wells: there are no tanks. The wells, if not in constant use, are liable to pollution.
12. The water supply is abundant at all times. Its colour is rather blue, but its taste is agreeable, and it has no smell. It is soft and of good quality, and its amount is sufficient. There are no special means for raising and distributing it in use. No better supply could be obtained.
13. Dhoolia is situated on a plain screened by ranges of surrounding hills, and is consequently exceedingly hot.
14. New stations are selected by the quartermaster-general's department, in consultation with the medical authorities. No improvement in the mode of selection is suggested.

II. CLIMATE.

1. The only instruments for registering meteorological observations are a thermometer and a pluviometer, which are in charge of the civil surgeon.
2. Table of observations from September 1853 to March 1858.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature at 4 P.M.	Rain, Inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks as to Clouds, &c.
January	No barometer at the station.	70·38	18·59	80·25	61·66	Not registered.	63·25	102·98	None.	N.N.W.	No data to go by.	No data.	No data.
February		75·55	20·6	85·74	65·14		64·71	105·91	·21	N.N.W.			
March		82·52	20·26	91·95	71·69		68·17	113·04	·64	N.W.			
April		87·88	19·6	98·11	78·51		73·56	114·98	·50	N.W.			
May		91·26	18·15	101·39	83·24		76·96	115·14	2·30	W.S.W.			
June		87·29	12·34	93·72	81·38		78·67	102·84	15·27	S.W.			
July		81·66	5·96	84·59	78·63		76·69	88·65	21·21	S.W.			
August		79·88	6·65	83·82	77·17		76·99	85·60	9·52	S.W.			
September		80·01	7·42	83·45	76·03		76·78	90·8	20·97	S.W.			
October		79·97	13·54	86·2	72·66		73·56	97·95	13·28	W.N.W.			
November		75·91	17·9	83·22	65·32		67·2	100·39	None.	N.W.			
December		71·8	19·82	80·52	60·7		63·44	95·88	·3	N.N.W.			

Total fall in 5½ years.

3. The climate is hot and muggy; it is not influenced by irrigation, and there are but few dust storms. It seems beneficial to the health of the troops (native). During the extremity of the hot weather the drills and exercises are of limited duration; the duties of course remaining the same. March, April, and May, and the early portion of June, are the most healthy months, and October and November the most unhealthy. Fevers, with liver and spleen complications, prevail during the latter months.
4. The Mulligaum districts, south of the Arnee range of hills, are more healthy than the present station. The station of Malligaum is 34 miles distant, is 300 feet more elevated than Dhoolia, is perfectly drained, amply supplied with water, quite open to the breeze, more free from fever during the months of October and November, and has a climate in every way more suitable to the European constitution. The only reason which can be urged against its adoption is that costly public buildings have already been erected at Dhoolia.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	5. The stations at which I have served, with their comparative salubrity, are given as follows:— 1. Poona.—Healthy. 2. Bombay.—Unhealthy. 3. Ahmedabad.—Unhealthy. 4. Kurrachee.—Healthy. 5. Hyderabad.—Variable. 6. Shikapore.—Variable. 7. Mhow.—Healthy. 8. Rajcote.—Healthy. 9. Mulligaum.—Healthy. 10. Aden.—Unhealthy. 11. Deesa.—Healthy. 12. Nusseerabad.—Unhealthy. 13. Neemuch.—Unhealthy.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the country and station are forwarded. 4. Table of barrack accommodation. Date of construction of barrack, 1858. Total of rooms or huts - - - - - 372. Total regulation number of non-commissioned officers and men - - - - - - 372 { Native infantry troops.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
Of native officers:		Feet.	Feet.	Feet.							
Subadars - - -	1	20	10	11	2,200	2,200	200		The pendalls are open sheds without doors or windows.		
Jemidars - - -	1	12	12	11	1,584	1,584	144				
Non-commissioned officers	1	15	10	7	1,050	1,050	150				
Rank and file - -	1	7½	10	7	525	525	75				
Quarter guard-room, composed of three rooms, one of which is used as a prison cell - -	15	15	12	11	1,980	237					
		12	12	11	1,584						
		12	12	11	1,584	1,584	144				

5. There are no windows, doors, verandahs, or jalousies or jhilmils to the barracks.
6. Native troops do not use bedsteads or cots, but always provide their own bedding, which they spread on the floor. No improvements are suggested.
7. The tents used are regulation double-poled rowties for native cavalry, the cubic contents of which are 1,200 feet, breadth 14 feet, height 10 feet, extreme length 25 feet, and length between the poles 9 feet. The area per man 11·7 feet, and the number of men in each 30.
8. No special means of ventilation are provided in barracks, huts, tents, or guard rooms. Sufficient ventilation is obtained by opening the tents, &c. In pendalls for native troops no means of cooling the air are provided.
9. The barracks or pendalls are constructed of fire-burnt brick pillars and walls, the roofs are double-tiled, and the posts are of cut teak-wood. The tents are of cotton wove cloth, and the huts are constructed of mud.
10. The floors are of moorum, rammed and watered, and are raised 1½ feet above the ground. There is no passage of air beneath.
11. The materials and construction of the pendalls are good. The huts are merely temporary buildings, and the tents are well adapted for the purpose. It would be an improvement if the pendalls were provided with ventilators in the roof. The barracks and cantonments are kept in repair by the executive engineer, and the repairs are quickly executed. The staff officer is responsible for the general sanitary state of the cantonment. There are no stated intervals for cleansing and limewashing pendalls, but it is done when required, as the commanding officer may direct.

12 to 15. There are no lavatories or cook-houses, neither is there any convenience for washing and drying linen. There are no privies or urinals. There are no means of lighting at night.

16. The natural drainage is sufficient for conveying away readily and efficiently all surface water. No part of any building used as barrack or hospital is damp. The drainage is sufficient for all purposes. There are no cesspits or foul ditches. There are no means of drainage or sewerage.
17. The cleanliness of the sepoy lines is maintained by sweepers; this cleansing is efficiently and duly performed, and the refuse is disposed of to the tile and brickmakers.
18. The surface of the station is kept free of vegetation. There are no old walls, thick hedges, &c. interfering with the ventilation of the station or bazaar.
19. The bazaar is well drained and open to the breeze; it is amply supplied with water; maintained in a state of cleanliness; and not crowded. The inhabitants of it maintain a sweeper. No improvements are required. The native houses near the station are generally in a good condition; no dung-heaps or cesspits are permitted within them. No nuisance is experienced in barracks from wind blowing over the native dwellings.
20. There being no European troops, this query as to slaughtering places does not apply to the station.
21, 22, 23. There are no stables for horses or picketing grounds. No quarters for married men exist at the station.

Officers' Quarters.

1. The officers' quarters are decidedly bad. If Dhoolia is to be the permanent head-quarters of a regiment, additional accommodation for officers is absolutely requisite.

IV. Health of the Troops:

1. The station, district, and adjoining native population are healthy, but the climate is not adapted to European soldiers.

2. The most prevalent diseases are fevers and spleen disease.

DHOOLIA. BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	3. The healthiness of the native population is attributable to the air and water being good. 4. The head-quarters H.M.'s 26th were at Sattara from 3rd January 1855 to 26th December 1856. Their general health there was good, the prevailing diseases being fevers and rheumatism. They were in Persia from 1st February 1857 to 4th September 1857, and while there their general health was good. The prevailing diseases were fever and bowel complaints. They were at Dhoolia from 30th November 1857 to 22nd November 1858, and on field service and outpost duty at Khandeish from 22nd November 1858 to 15th June 1860. Their general health is very good. The prevailing diseases have been fevers. No portion of the men's present accommodation is more unhealthy than the rest. 5. The troops are not camped out. 6 to 13. No experience of troops at hill stations. 14. Frequent change of station is not beneficial to the health, and damps the spirits of the troops. 15, 16. No experience with troops at hill stations. 17. Galna might be advantageously used as a hill station for a small number of convalescents, not exceeding 100. The distance from the station is 24 miles, and access is obtained to it by means of a country cart road. Its elevation is 700 feet above the plains, and it possesses a temperate climate. 18. Moorum is the most healthy class of surface for stations. 19. Soldiers proceeding to India should be from 20 to 23 years of age, and they should land there in November. I cannot say how troops are disposed of on their arrival, but recruits, on first landing in India, should be kept from liquor, and given abundant occupation for mind and body. 20. Troops should be sent direct from the home depôts to India, and on landing should, if practicable, be sent to hill districts to gradually accustom them to the climate. 21. Troops march on foot to the interior, or are conveyed by bullock transport trains, if their route lies along any of the great trunk roads. I am not aware of any additional precautions that are required. 22. About 12 years is the length of time a British soldier should serve in India. 23. I have no suggestions to make as to the mode of conducting the business of medical boards in regard to invaliding. 24. Invalids should leave India for home in January.
Diseases.	1. There are no regular inspection parades for the discovery of incipient diseases at the station. 2. There has been no scorbutus among the troops. 3. The proportion of hepatic disease among the native troops at the station is very insignificant, and generally is in the form of functional derangement. 4. Dracunculus is not (as far as my experience leads me) endemic to Dhoolia or its neighbourhood. I suspect the animal, in an early stage of existence, is taken into the stomach with the water drank. The prophylactic measures are, to be careful of the water in places notorious for Guinea worm; and if obliged still to drink it, to have it boiled. 5. One in 40 has been the proportion during the past 12 months of the constantly sick from venereal disease to the total sick in H.M.'s 26th Regiment N.I. Lock hospitals would be advantageous to the health of the population generally, and of the army particularly. 6. The following diseases, of the endemic or epidemic form, are those from which the troops suffer:— *Fevers.*—Intermittent, especially of the quotidian type, are more or less prevalent throughout the year, but not to any serious extent, and generally severest in November and December. Fatal cases in natives are generally complicated with some internal inflammation or congestion. *Dysentery.*—Not particularly. *Cholera* is more or less prevalent every hot season. No cases occurred in the regiment during the past official year. *Small-pox* very rare indeed, vaccination being imperative. *Rheumatism* is not prevalent to any serious extent, and very rarely with acute symptoms.

The following is the proportion of admissions and deaths from these diseases to total admissions and deaths:—

Diseases.	Per-centage of Admissions to Total Admissions.	Per-centage of Deaths to Total Deaths.
Fever - - - -	54·97	None.
Dysentery - - - -	·55	"
Cholera - - - -	—	—
Small-pox - - - -	·27	"
Rheumatism - - -	6·96	"

7. I am unaware of any diseases of the zymotic class being endemic to Dhoolia or its neighbourhood. Cholera, in its epidemic form, is the most frequent and regular in its occurrence, cases occurring sporadically at any season. In the cold season measles and mumps generally appear and small-pox and epidemic cholera throughout the hot season. Before an outbreak of the latter the air is very commonly close, hot, and sultry. The sanitary condition of the station is very good, and that of the town very superior to native towns generally. Epidemic cholera appears to have very few caste prejudices, attacking alike the rich and poor, the strong and the more delicate of both sexes.

8. This query is applicable only to European troops.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —Diseases—*cont.*	9. Small doses of quinine have not been tried at the station as a prophylactic against malarial diseases. 10. No suggestions to offer on any of the preceding points.
V. Intemperance.	1. The soldiers at the station are temperate; there are no confirmed drunkards. 2. This query does not apply to native troops. 3. Distilled spirits are sold in the bazaar of infamous quality; the amount consumed by each man is not known, but is thought to be small. Spirit is no part of the ration for native soldiers, either at the station, on march, or in the field. It is given to convalescents under medical treatment. Arrack, brandy, or wines are given medicinally. No drinks other than intoxicating drinks are sold in the bazaar. Drunkenness *per se* is not punished as an offence. 4. The consumption of spirits by troops is injurious to health, and not conducive to the efficiency or internal discipline of the corps. 5. It would be decidedly beneficial to abolish the issue of spirituous liquors altogether. 6. Malt liquors are far more beneficial to health than spirits or wine. 7. Coffee, tea, lemonade, and sherbets and water are much used here, more especially the latter, and are preferable to both spirits and malt liquors. 8. It would be beneficial to the health of troops to suppress altogether the spirit ration, and to substitute for it beer, tea, and coffee. 9. It would be beneficial to prohibit the sale of spirituous liquors in canteens, and to permit only beer, coffee, tea, &c., to be sold to the troops, provided the soldier could not purchase inferior spirits elsewhere. 10. I have no recommendations to make on these points, unless the introduction of light wines of France in wood be considered advisable. 11. There are no bazaar regulations.
VI. Diet.	No replies to queries under this head, the subject being only applicable to European troops.
VII. Dress, Accoutrements, and Duties.	1. The soldiers' dress at the station consists of a scarlet tunic of cloth, black cloth pantaloons, and black and also white cotton pants. The accoutrements are a pouch and bayonet belt, with knapsack. They have also a Kilmarnock forage cap, with white cover, ancle boots, and grey great coats for native troops. The present dress is suitable, but a khakee tunic and dhotee might be added to the above kit for field service, on march, and on guard mounting during the hot weather, and the black and white cotton pantaloons abolished. I have no suggestions to offer, except that woollen clothing (tunic) should always be worn on night duty. The present guard dress in the hot weather is scarlet tunic and black cotton pantaloons, and in cold weather and rains scarlet tunic and cloth pantaloons. The men on guard are protected by a verandah from the sun and wet.
Duties.	1. The men should be drilled at home before being sent to India, as they would be better able to defend themselves if attacked on board ship, and would be more useful if their services were required at any place en route. 2. The usual routine of a soldier's duties at the station are: a parade in the morning commencing about half an hour after reveillee, lasting one hour to one hour and a half; also a parade in the evening during the drill season,—usually the cold weather, of about three-quarters of an hour in duration, three times a week. The men do not suffer in health, but on the contrary, drills are found conducive to health. The best hours for drills are those immediately after day-break, same for parades. Marches in the hot season should invariably be commenced about half an hour before sunset; in the cold season about 3 or 4 o'clock in the morning. There are general orders on the subject. The men have two and a half nights in bed during the week. 3. Guards are mounted about 21 yards from the barracks, they last for 24 hours. There are roll calls morning and evening. Night guards render men on them liable to fevers and rheumatism, but no additional precautions in performing this duty can be taken.
VIII. Instruction and Recreation.	1. The only means of instruction at the station is a regimental school with a good schoolmaster. No means of recreation are provided, as the natives amuse themselves in their own particular fashion, and are not interfered with during their hours of relaxation. They have both quoits and skittles. There is no restriction on the men as to exposure to the sun and rain out of barracks when off duty. 2. The native troops should be instructed in field-works and in road-making; they should be taught to be self-supporting, *i.e.*, to make their own clothes, boots, shoes, &c., to build their own huts, making bricks, tiles, doors, and windows. For recreation they should have lectures on the mechanical arts, and on electricity, galvanism, and chemistry, illustrated by experiments. 3. The institution of savings' banks would be advantageous. 4. Does not apply to native troops.
IX. Military Prisons.	1. There are neither prison nor cells at the station.
X. Field Service.	1. I am not aware of any local regulations for medical field service, not included in the General Presidency Regulations. 2. The medical officer on the march is bound to offer any suggestions which he may think conducive to the health of the troops, and this course is found to be attended with advantage. 3. The practical operation of the regulations for preserving the health of troops in the selection of camping grounds, &c., as laid down in the separate general orders of the Bombay army is admirable. The medical officer represents to the military authority his opinion on the subject whenever he may consider that the ground selected is unhealthy. 4. The arrangements for field hospitals, ambulances, &c. are laid down in the Medical Regulations, Section XI. p. 123 to 134, of 1849.

References to Subjects and Queries.	Replies.
XI. Statistics of Sickness and Mortality.	Dhoolia.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per cent. to Strength. Treated.	Ratio per cent. to Strength. Died.
	QUEEN'S TROOPS.																					
	EUROPEAN TROOPS.																					
1858-59	Detachment H.M. 3rd Dragoon Guards Do. do. 18th Royal Irish Do. do. 57th Regiment	74	82	—	—	—	10	—	2	—	13	—	—	—	—	—	39	—	96	—	129·7	—
	NATIVE TROOPS.																					
1851-51	Detachment 11th Regiment Native Infantry Do. 16th do. do. Do. Poona Irregular Horse Do. Bheel Corps	1,059	261	1	8	2	5	1	1	—	8	1	21	—	2	2	285	1	591	8	55·8	0·7
1851-52	Do. 16th Regiment Native Infantry Do. Poona Irregular Horse Do. Bheel Corps	946	234	4	10	—	2	—	—	—	43	1	9	—	2	1	249	1	549	7	58·0	0·7
1852-53	Do. 11th Regiment Native Infantry Do. 16th do. do. Do. Poona Irregular Horse Do. Bheel Corps	1,019	111	1	1	—	2	—	—	—	32	—	8	1	—	—	521	—	675	2	66·2	0·2
1853-54	Do. 11th Regiment Native Infantry Do. Poona Irregular Horse Do. Bheel Corps	945	88	1	2	—	—	—	2	—	32	2	—	—	—	—	461	—	585	3	61·9	0·3
1854-55	Do. 11th Regiment Native Infantry Do. Poona Irregular Horse Do. Bheel Corps	920	179	—	1	—	2	—	3	—	36	1	3	—	4	1	290	—	518	2	56·3	0·2
1855-56	Do. 19th Regiment Native Infantry Do. Poona Irregular Horse Do. Bheel Corps	891	76	—	—	—	—	—	—	—	16	—	3	—	—	—	244	—	339	—	38·0	—
1856-57	Do. 19th Regiment Native Infantry Do. Poona Irregular Horse Do. Bheel Corps	910	230	2	1	—	9	2	1	—	21	2	5	—	—	—	290	1	557	7	61·2	0·7
1857-58	26th Regiment Native Infantry Detachment Poona Irregular Horse	762	258	6	9	—	23	3	14	—	108	2	11	1	—	—	251	2	674	14	88·4	1·8
1858-59	26th Regiment Native Infantry 30th do. do. Detachment Poona Irregular Horse	805	346	2	10	—	9	1	3	1	29	—	8	—	—	—	334	—	739	4	91·8	0·4
1859-60	30th Regiment Native Infantry Detachment Poona Irregular Horse Do. Bheel Corps	1,190	509	6	6	—	23	—	8	1	72	3	9	—	29	12	402	—	1,058	22	88·9	1·8

By order of the Principal Inspector-General, Medical Department,

W. C. Coles, Assistant Surgeon, Secretary.

Office of the Principal Inspector-General, Medical Department, Bombay, 22nd December 1860.

XII. Hospitals.

1, 2. The hospital is about a quarter of a mile from the barracks in a north-west direction, and about a quarter of a mile west of the bazaar and town of Dhoolia. The site is not open or freely ventilated, for the out-buildings are to windward of the hospital and interfere with the ventilation; it is however healthy, but might with advantage, be more elevated.

3. The water supply is abundant and wholesome.

4. There is no refuse water, and the other impurities of the hospital are removed by sweepers.

5. The wards are raised about 3 feet from the ground. There is perflation of air underneath the floors. The roof water sinks into the subsoil and speedily passes away. There is a ditch which runs round the exterior of the building and rapidly carries off the rain-fall. The hospital is built of brick and chunam; the roof and walls are not double, with ventilation between, but are sufficiently thick to keep the building cool. The hospital is surrounded by a verandah nine feet wide, which affords sufficient shelter from the sun's rays. The verandahs are interior. The building being too small for its present purpose, constituted as it was for a detachment of four companies only, the verandahs are necessarily used for the accommodation of the sick. The hospital consists of one room only on the ground floor.

Table of Hospital Accommodation.

Total number of wards—one.

Total regulation number of beds—12.

Wards or Hospital Huts. Number.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents.	Superficial Area in Feet per Bed.	Height of Patients' Bed above the Floor.	Windows. Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.	Feet.	Inches.		Feet.	Feet.
Centre room, 1	12	32	22	16	11,264	17¼	18	4	5	4
Verandah	About 20	41	9	10	3,696					

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	The hospital is not so placed as to receive the full benefit of the prevailing winds. The windows open inwards, and are conducive to ventilation and coolness. 6. No means of ventilation beyond doors and windows are adopted, but the ward can thus be kept free of odour or closeness. There are no jalousies or jhilmils. 7, 8. No artificial means of cooling or warming the air of wards are employed. The walls of wards are whitewashed and cleansed every three months. 9. The privy is on the south-east corner of the hospital enclosure; it is built of stone and chunam, and tiled. The contents are removed daily by sweepers; no cesspits or drains are therefore required. 10, 11. There are no lavatories or means of bathing the sick. 12. There are no means of washing the hospital linen beyond the native washermen employed. 13. The storage is sufficient and dry. 14. Common wooden bedsteads laced with tape are used in hospital. The sepoys bring their own bedding, each being required to bring two clean sheets. No improvements are suggested. 15. The sepoys' food is cooked in an open shed in the south-west corner of the hospital enclosure. 16. No reply to this query. 17. The hospital orderly is always in attendance, and the sick, as may be necessary, are nursed by a comrade. 18. The hospital is too small for the number of troops now at the station, but no epidemic disease is known to have appeared within it. 19. The compound of the hospital should be enlarged; the out-houses should be placed further off and to leeward. The walls of the hospital are not high enough; an additional ward is required, and the whole building should be properly ventilated and sheltered from the sun by external verandahs. 20. This question does not apply to native troops. 21. The sick wives and children of sepoys, equally with themselves, receive medical attendance. No improvement is suggested in the present arrangement. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations. 23. The medical officer has unlimited power with respect to the sanitary state of his hospital; change of diet and medical comforts rest entirely with himself. All requisite repairs are executed immediately. 24. There are no wards or hospital accommodation at this station for convalescents, nor are any thought requisite.
XIII. Burial of the Dead.	1, 2. There is a small burial ground for Europeans within the station to the leeward of the prevailing winds. Its area is 100 feet by 46 feet, and is surrounded by a six-feet wall. The soil is black, and the subsoil is moorum. A drain runs along the south side. 3, 4. These queries apply only to European troops, of whom there are none at the station. 5. The dead of camp followers and bazaar people are disposed of according to caste. The Mahomedans are buried, and the Hindoos burnt. 6, 7. No injury accrues to the public health from the present practice, and no improvement is suggested.

(Signed) R. R. Powell, Major,
H.M.'s 26th Regiment, Bombay N.I.
J. M. Greig, Captain Engineers.
Henry Pitman, Assistant Surgeon.

31st October 1860.

SEROOR.

Accommodation.—Native Troops. { Cavalry, irregular, 25 for native commissioned, 32 for non-commissioned officers, and for 400 rank and file.

References to Subjects and Queries.	Replies.
I. Topography.	1. The station of Seroor is situated nearly midway between Poona and Ahmednuggur, on the trunk line of road which connects those two places. It occupies an elevated open position with regard to the country around, which has the character of being hilly, and for the most part uncultivated. On the north side of the Goar river there is a succession of hills rising in ranges one above another, and extending for a considerable distance along the bank; but on the south side, on which the station is situated, the features of the country are more regular, and the hills are only to be seen at intervals. There is no wood or jungle to be met with in the vicinity of the station, and only the small quantity of water which flows in the bed of the Goar river. 2. The elevation of the station above the sea is 1,752 feet, but has scarcely any elevation above the adjacent country, in some places being higher and in others lower than the surrounding ground. The nearest water is the Goar river, above which the station stands at a height of 45 feet. There is no ground adjoining the station which would afford a better or healthier site than that which it at present occupies. The position has been found advantageous both for European and native troops for a period of 50 years and upwards. 3. The nearest mountain or table land which presents opportunities for establishing a sanitarium is at the hill fort of Poorundhur, near Poona. There is no elevated ground adapted for the purpose in the vicinity of the station.

SEROOR. BOMBAY.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	4. The river Goar flows close by the station, but with this exception there is no other body of water in the neighbourhood. During the four months of the year which constitute the rainy season, the bed of the river is generally full, and in extraordinary freshes the water sometimes overflows the banks, but not to an extent sufficient to cause injury to the buildings in the town or station. The period during which such an overflow lasts is confined to a few hours. There are no pits or broken ground in which water lodges in or around the station. 5. The station generally is remarkably open and exposed to the prevailing winds. The hedge rows and gardens are kept in good order, and strict rules are enforced by the station authorities for the prevention of an undue growth of vegetation. The buildings are not exposed to the disadvantage of reflected sun heat. The sea breeze is the wind most commonly prevalent in the station; land winds also frequently blow, but no injurious effect is known to arise from their occurrence. 6. To the south of the station the country assumes a cultivated appearance, but in other directions it is singularly bleak and barren. Irrigation is not carried on in the vicinity of the station, except watering a patch of ground here and there from wells. It is not, therefore, possible to judge of the effect artificial irrigation exercises upon health. The cultivation of rice is prohibited within camp limits, but is carried on about half a mile outside. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The town of Seroor, containing a population of 7,000 inhabitants, is contiguous to the cavalry lines, which occupy a position on the north of the station. 8. In its geological structure the district is chiefly composed of traprock, the general formation of the ranges of hills which traverse this part of the Deccan. In the valleys and the more level tracts of ground this stratum is covered with a surface layer of black soil, which, however, has no very considerable depth. 9. Water is usually found during the dry season at a depth of 30 feet from the surface, and during the rainy season at a depth of 20 feet. 10. The water from surface drainage is freely carried off, most of it by the rapid inclination the ground possesses, and partially by drainage in the porous subsoil; none of it is retained on the surface. The high ground adjoining the station is of limited extent, and has little influence in adding to the supply of drainage water which passes through the station. 11. The native portion of the community, both of the town and station, derive their supply of water from the stream which perpetually flows in the bed of the Goar. The Europeans, who are very limited in number, obtain their drinking water from wells, sunk within the compound enclosures. The system of storing water in tanks is not adopted in the station. 12. The water supply of the station is unlimited. The Goar river for four months in the year flows with a full rapid stream, and for the remainder of the season there is always copious and constant flow of water in the bed. The water contains a small portion of lime, is hard, of very good quality, not at all injurious to health, and abundant in quantity. It is obtained directly from the river, and no better supply can be had. 13. There are no other topographical points to remark on, as the station is very healthy. 14. The selection of sites for hill or plain stations is conducted by a committee appointed by Government, and constituted of officers of the engineers, medical, and quartermaster-general's departments, and a better arrangement cannot be suggested.
II. CLIMATE.	1. The only instruments available at the station for meteorological purposes are an ordinary thermometer, a minimum self-registering ditto, and a rain gauge or pluviometer. Up to two years back there were also a barometer and a wet bulb thermometer, but these instruments are no longer in existence here. The temperature both inside and outside is noted and registered four times a day, as is also the direction of the wind. The amount of rain, when any falls, is measured and noted every day. Besides these observations the maximum temperature in the sun's rays and the minimum temperature are also daily observed and noted. 2. Table of meteorological observations from the 1st January 1854 to the 31st October 1858:—

Months.	Barometer Mean.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Rain, Inches.	Winds. Direction.
		°	°	°	°	°		
January	27·444	72	94	50	73	54	5 cents.	E. & S.E.
February	27·437	71	94	51	72	58	27 „	N.W.
March	27·399	80	101	59	81	52	38 „	W. & N.W.
April	27·342	87	107	64	87	63	87 „	N.W.
May	27·306	83	98	69	84	69	2 inches 94 cents.	W. & N.W.
June	27·264	81	96	69	81	71	3 „ 70	W. & S.W.
July	27·251	76	91	68	76	71	3 „	W. & S.W.
August	27·298	76	88	68	76	70	1 „ 48 „	W. & N.W.
September	27·345	76	84	66	76	70	3 „ 92 „	W. & N.W.
October	27·401	77	96	68	77	66	3 „ 69 „	N.W. & S.E.
November	27·256	75	95	59	75	59	73 „	S.E.
December	27·528	72	99	50	72	52	None.	E. & S.E.

3. The character of the climate of Seroor resembles in its main points those of the Deccan generally. It is, on the whole, and with the exception of the monsoon months, dry, but not excessively so, being within the influence of the sea breeze, which generally blows pretty strongly towards the evening. The variations of cold and heat, dryness and moisture, are very moderate, and not generally sudden. There is no tree planting or irrigation carried on to such an extent as to influence the climate generally. The air is usually free from dust and other impurities, with the exception of the dust storms, which occasionally occur during the hot season, but which are not frequent. The climate of Seroor seems to exercise a very favourable influence on the health of the native troops now stationed here, amongst whom there is a very small amount of sickness, and its influence was, I believe, equally favourable

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	on that of the European troops that were formerly stationed here. I am not aware of any particular precautions being rendered necessary by the climate, other than those usually observed at all stations during the height of the hot season. There are no marked distinctions as to healthiness or unhealthiness during the different months of the year. The prevailing diseases vary only according to the different seasons; bowel complaints being frequent during the monsoon, and during the cold season rheumatism and affections of the air passages. 4. There is no district within many miles the climate of which is more conducive to health than that of the station. 5. The stations at which I have served are Ahmednuggur, Kirkee, Poona, Poorundhur, Kurrachee, and Seroor; but in all these stations my residence has been of short duration, and the present station is the only one in which I have resided throughout the year. I should say, as far as my limited experience enables me to form an opinion, that all these stations are more or less conducive to health; but I do not feel myself capable of giving a decided opinion on the comparative salubrity of these different stations; certainly not one of them can be considered as positively injurious to health.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station, adjacent country, and barracks are forwarded. 4, 5, 6. These queries and table of barrack accommodation apply solely to European barracks, none of which of a permanent kind are at Seroor, the station being exclusively occupied by native irregular cavalry who reside in huts. 7. No tents are issued to the troops in the irregular service, they being expected to furnish themselves with these articles. 8. This question is applicable to Europeans only. 9. The materials employed in the construction of barrack buildings are generally of a permanent kind; viz., burnt brick and lime walls, and single-tiled roofs. 10. The floors are, on an average, one foot above the ground, and are constructed of moorum beaten down, and consolidated with water. 11. The buildings, both in the nature of the materials of which they are constructed, and the arrangement in which they are designed, are well suited for the shelter of the troops who occupy them. Repairs are executed, whenever considered necessary, on instructions issued by the officer commanding the station, who is also responsible for the general sanitary state of the cantonment. The walls are limewashed periodically at the discretion of the commanding officer, and usually when a change of occupants of the huts takes place. 12 to 16. These questions apply solely to European barracks. There are no pools or foul ditches within the limits of the station. 17. The surface cleansing of the cantonment is performed by sweepers, of whom an adequate number is entertained for the use of the regiment Poona horse; the refuse is burnt. 18. The surface of the cantonment is entirely kept free from vegetation. There are no old walls, thick hedges, &c., to interfere with the proper ventilation of the station, bazaar, &c. 19. Regulations are enforced to have the principal streets in the bazaar always kept clean, and the inhabitants have been compelled to make efficient arrangements for the proper drainage of the place, and to remove all water which may lodge opposite their dwellings. The water supply is derived from the stream of the Goar river, which flows close by the town. All regulations and arrangements for the sanitary state of the bazaars are under the civil authorities, and have always been found satisfactory. The native houses, like those in most native towns, are built of mud-walls, and covered with tiled roofs. Their condition generally exhibits carelessness and negligence on the part of their owners to keep them in proper repair; but cleanliness is as much as possible enforced by the authorities. No nuisance is experienced from wind blowing over the native houses. 20. All arrangements for the slaughter of animals are under the civil authorities, and the Mussulmen of the corps supply themselves, according to their wants, from the bazaar. No inconvenience from the present arrangement has been experienced. 21. The arrangements for stabling or picketing the bazaar horses, and those of the camp followers generally, are all under the civil authorities. 22. There are no cavalry stables; the manure is removed to the rear morning and evening, and periodically sold. The horses are picketed in front of their owners' houses, at a long distance from the hospital. 23. No reply to this query.
Officers' Quarters.	1. The officers' quarters are all very open, well ventilated, and drained, and remarkably healthy. No improvements are suggested.
IV. Health of the Troops.	1. The station, district surrounding it, and the native population adjoining, are, as far as I am aware, generally very healthy. 2. Fever usually prevails to some extent amongst the native population, after the termination of the monsoon, but the cases are generally of a mild type, and very amenable to treatment. I am not aware of cases of spleen disease being prevalent. The epidemics which most frequently prevail are cholera and small-pox. The former is usually present in greater or less extent during the hot season, previous to the setting in of the monsoon; but it occurs generally in a mild form, and its duration is not protracted. Small-pox occurs but very rarely, and then only in particular parts, when the sanitary condition is very defective. 3. I consider that the healthiness of the station of Seroor and the neighbouring native population is due to the open situation, its exposure to prevailing winds, the almost total absence of all causes likely to engender malaria or noxious exhalations, and the dry character of the soil generally. There is also a constant supply all the year round of good wholesome river water, which may be looked upon as an important element in conducing to the healthiness, generally speaking, of the inhabitants of the neighbourhood. 4. This station is the permanent head-quarters of the Poona irregular horse, who have been stationed here for many years, during the whole of which period they have enjoyed the most excellent health. I am not aware of any portion of the men's accommodation being more unhealthy than the rest. 5. No system of camping out is carried on, but a large portion of the regiment is always away from the station on outpost duty in the surrounding districts, and the result as to the health of the men varies according to the salubrity or otherwise of the different posts,

SEROOR. BOMBAY.

References to Subjects and Queries.	REPLIES.
IV. Health of the Troops —*cont.*	though not sufficiently so to make any appreciable difference in the general health of the regiment. 6. I was in medical charge for rather more than three months, during the monsoon of 1857, of the hill station Poorundhur, near Poona. This station is a sanitarium for the reception of convalescents from the different European regiments serving in the Deccan and other parts of the Bombay presidency; but is not used as a hill station for healthy troops. With regard to the purpose for which it is used, the result of my limited experience is that in well selected cases, and after taking into consideration the season of the year during which the convalescents from different diseases are to be stationed there, the patients derive very considerable benefit from a more or less prolonged residence at a hill station. During my short residence at Poorundhur, however, it was in two or three cases painfully evident that, in order to gain the full benefit of a hill climate for convalescents, the greatest care is required to be taken in selecting the cases to be sent to these stations. 7. My experience is too limited to give an opinion as to whether troops resident for some time in hill stations are more or less liable to attacks of febrile or other diseases on returning to the plains, the greater portion of my service having been passed in charge of native troops; but I am of opinion that from the generally improved state of health and increase of stamina engendered by residence in a hill climate, and absence for a time from the debilitating influence of the plains, the predisposition to attacks of those diseases would be decidedly lessened, and this opinion, I think, is borne out by the experience of those European officers and their families who are able to get away from the plains and reside at one of the hill stations during the hot season. 8. I am of opinion that well-selected hill stations would exert a most favourable influence on the health of the troops residing in them. 9. I am not aware of any diseases peculiar to hill stations with which healthy troops are liable to be attacked on going to them, provided the season chosen be a favourable one. For weakly soldiers who have a predisposition to particular diseases, such as cardiac disease, rheumatism, or lung affections, I am of opinion that the hill climate is anything but beneficial, unless the hill selected be of low altitude, and it would therefore be desirable that the selection of men to be sent to hill stations should be left to the discretion of medical officers instead of their being taken indiscriminately. 10. I would recommend that men be provided with liberal means of healthful recreation and amusement, and that, as far as practicable, they should be exempted from duties of all kinds, in fact that the period of their sojourn in the hill should be a kind of holiday, spent in such a manner as to invigorate them, and put them in such a state of health as would enable them to bear with comparative immunity the heat of the plains on their return to them. I would send the third or fourth part of a regiment every year, so that every man might have the benefit of a hill climate once in every three or four years. 11. My experience of hill stations is confined to the rainy months, and with reference only to convalescents. For healthy troops I should say that the season during which the hill climate is most required, and is of the greatest service, is the hot season embracing the months of February, March, April, May, and perhaps part of June. I do not think that a residence of shorter duration than that mentioned would enable troops to obtain the full benefit to their health of such residence; but I do not think that any longer residence would, as a general rule, be required. 12. I do not think there is any period of residence beyond which injury is likely to be inflicted on the health of troops on returning to service in the plains, provided the hill station be a well-selected and suitable one. 13. I am not aware of any special precautions being required for protecting the health of troops on leaving hill stations for the plains. 14. The experiment of locating healthy troops serving in this country on hill stations for a more or less prolonged period, has not, as far as I am aware, been carried out hitherto on anything like an extended scale. My own impression, however, is that short periods of change to hill stations during the very hot months, and service on the plains during the remaining portion of the year, would be equally if not more conducive to health than their location on hill stations, with short periods of service on the plains. Frequent change of station on the plains, except where the change is from a healthy to a notoriously unhealthy one, and provided the precaution is taken of effecting the change during the most favourable season, is, I believe, undoubtedly beneficial to the health and spirits of the troops and convalescents. 15. In all the hill stations with which I am acquainted the barrack and hospital accommodation is very limited, these stations having hitherto been intended solely for the reception of convalescents, and there is not, as far as my knowledge goes, accommodation on any of the hill stations in the Bombay presidency for any considerable number of troops. At Poorundhur there is barrack accommodation for 100 men, and a hospital adapted for about 40 sick. There is also a patcherry capable of accommodating ten families, and a small female hospital in course of erection, which must be by this time approaching completion. 16. Cannot say what elevation above the sea is most suitable for hill stations. 17. There is no higher ground in the neighbourhood of this station, nearer than Poorundhur, which could be advantageously occupied as a hill station. 18. The soils for stations both as regards surface and subsoil, should be light, tolerably dry, and porous so as to allow any excess of moisture to drain away freely. 19. I consider that the best age for soldiers to proceed to India ranges between 25 and 30, and they should land there at the commencement of the cold season, which begins in the middle of November. 20. No reply to this query. 21. The transport of troops from the port to the interior is effected, if by water, in Government or private steamers or native vessels; if on land, by the railway or bullock train where available, or else by easy marches to their destination. I have no experience to enable me to state, whether any additional precautions are required for preserving the health of troops during their transport to the interior. 22. Cannot say what number of years a British soldier should serve in India. 23. As far as I am aware, the manner of conducting medical boards in the Bombay presidency is not liable to cause any conflict of opinion as regards invaliding. No suggestion to offer on this subject.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	24. I am of opinion that the best time of the year for invalids to leave India for home is from the end of December to the end of February following, so as to reach England at the commencement of the spring, but after the time during which easterly or north-easterly winds prevail.
Diseases.	1. No regular inspection parades are carried out in this station, but the men have strict orders to visit the hospital on the first symptom of approaching illness.
	2. During the year which I have been in charge of troops at this station, I have not met with a single case of scorbutus or scorbutic disease, and on referring to the regimental records I find but one case noted during many years, and that occurred whilst the regiment was on field service in Persia in 1857.
	3. No case of hepatitis has occurred during the last year.
	4. Cases of dracunculus are very frequently under treatment, but they do not usually originate here. It occurs in men who have joined head quarters from out-post duty. There is so much difference of opinion concerning the exact species of the troublesome worm and its mode of entering the body, that I cannot offer any satisfactory explanation as to the cause of the attack. I would suggest, as a prophylactic measure, the necessity of very carefully drying the body after bathing, especially in tanks or other still waters, as the balance of opinion seems to favour the view of the guinea worm entering the body from the external surface.
	5. With respect to the proportion which the constantly sick from venereal diseases bear to the total sick in hospital from all other diseases, it is impossible to estimate it, as we have no constantly sick from this disease. The cases do not average more than six or eight during the year, which is to be accounted for by the fact of the majority of the men in irregular cavalry regiments being married.
	6. The troops at the station suffer from the following diseases of the endemic and epidemic class :—

Fevers.—The fever most prevalent at the station is the intermittent quotidian type, which generally occurs during the months immediately succeeding the monsoon; and to some extent during the hot season. Other forms of fevers are rare.

Dysentery of a mild type generally prevails to a small extent during the monsoon, and isolated cases are met with occasionally throughout the year, but are generally very amenable to treatment.

Cholera occurs epidemically during the hot season, and in varying degrees of intensity in different years, but the troops rarely suffer to any great extent from this scourge.

Small-pox is very rare indeed amongst the troops. The prophylactic measure of vaccination is assiduously carried on both amongst the troops, their families, and followers.

Rheumatism of a chronic character is the chief cause of admission into hospitals during the cold months. It occurs, however, chiefly among the aged and debilitated men of the corps, and is not serious in its effects.

The proportions which admissions and deaths from these diseases bear to the total admissions and deaths are as follows :—

Diseases.	Proportion of Admissions to total Admissions.	Proportion of Deaths to total Deaths.
Fever - - -	27 per cent.	18 per cent.
Dysentery - - -	·65 „ (6 cases only having been treated in 5 years.)	0 „
Cholera - - -	4 per cent. (4 cases admitted in the same period.)	20 „
Small-pox - - -	0 per cent.	0 „
Rheumatism - - -	6 „	2 „

An average deduced from the returns of a greater number of years would probably modify these figures in some measure.

7. Purely zymotic diseases are of rare occurrence at this station, and I am not aware of their having presented any special nosological character when they have occurred. They have not so far as I am aware prevailed more at one season than at another, and I cannot say what are the climatic or atmospheric conditions which precede or accompany their appearance. They have occurred almost without an exception among the native population residing in the lowest and most densely populated parts of the town, in which almost every element conducive to a defective sanitary condition is in force. These cases however, except when in great excess, do not come under my immediate observation. There is nothing in the personal habits or conditions of the troops likely to predispose to these diseases, but amongst the poorer native inhabitants causes predisposing to these, and in fact, to all kinds of disease, are rife. Amongst these cases I may enumerate exposure to weather at all seasons, insufficient clothing, uncleanly habits, and deficient and in many cases extremely unwholesome food.

8. I consider that the duties and occupations of soldiers in barrack, when not carried to excess, are conducive to health and adverse to the prevalence of epidemic disease. The same remark may be applied to their habits, when these are not of a hurtful or debilitating character.

9. Fever has never to my knowledge prevailed to such an extent as to lead to the experiment of trying small doses of quinine as a prophylactic.

10. Epidemic disease may be considered to be at a minimum at this station, and I have no recommendations to offer with regard to its prevention or mitigation.

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References to Subjects and Queries.	REPLIES.
V. INTEMPERANCE.	1. No body of men could be more temperate than the Poona horse, and there are no confirmed drunkards among them. 2. There are no admissions into hospital from diseases caused directly or indirectly by intemperance. No case of drunkenness is on record among the troops. 3. Arrack or native liquor is sold in the bazaar, and the sale being chiefly confined to the camp followers and persons residing out of camp limits, no average can be given of the amount consumed. No drinks injurious to health other than intoxicating drinks are sold in the bazaar. 4. The consumption of spirits by troops and convalescents is injurious to health, and not conducive to efficiency or discipline. 5. No reply to this query. 6. Malt liquor in moderation is most conducive to the health of Europeans in the relaxing climate of the plain, but wine and spirits are not at all requisite except medicinally. 7. Coffee, tea, lemonade, soda water, &c., are a good deal used at the station. No comparison as to their influence on health, efficiency, and discipline, in opposition to spirits, can be made, as the Poona horse do not drink the latter. 8, 9, 10. These queries are applicable only to European troops. 11. There are no canteen or bazaar regulations in force at this station.
VI. DIET.	The queries under this head refer solely to European troops, of whom there are none here.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements at this station consist of a turban, waistband, coat, trousers, jack boots and spurs, carbine or pistol, sword, pouch, carbine, and sword belts. The present dress is suitable to the climate and the soldiers' duties by day and night, but lighter clothing might more generally be adopted in the plains. The present guard dress in the Poona horse varies according to the season of the year. All guards and sentries at the station are under cover.
Duties.	1. No reply to this query. 2. The following is the routine of the soldiers' duties:—Parade twice or three times a week, and drill five days a week for an hour in the morning and evening. These do not in any way interfere with the men's health. The cool of the mornings and evenings are the best hours for drills, parades, and marches, and, if the march is a long one, during the entire night. Full instructions are published in Bombay Separate General Orders, page 80. The men have five nights in bed during the week. 3. Guards are mounted within a circle of 300 yards, and are relieved daily; sentries are relieved every two hours. There are no roll calls in the Poona horse. No bad effect has ever been caused by night guards at Seroor, which is a particularly healthy station.
VIII. INSTRUCTION AND RECREATION.	Queries under this head refer solely to Europeans, of whom there are none at Seroor.
IX. MILITARY PRISONS.	1. The standard guard of the Poona horse is the only place used for military confinement. It is open to the winds, well ventilated, and amply sufficient for the requirements of the station.
X. FIELD SERVICE.	1. There are no local regulations for field medical service, not included in the General Presidency Regulations. 2. On the line of march the medical officer has the power of offering suggestions as to the time of march, salubrity or otherwise of proposed sites for encamping ground, and other points of a similar nature. 3. The practical operation of the rules laid down for the preservation of the health of troops in camp, in page 145 of the Bombay Separate General Orders, seems to be all that is desirable. The power of the medical officer in this matter is described in the preceding answer. 4. The arrangements adopted in the presidency with reference to field hospitals, ambulances, &c., are detailed in the Medical Code of Regulations, and at page 161 of Bombay Separate General Orders.
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. The following table gives the statistics of this station:—

SEROOR.—NATIVE TROOPS.

Years.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
1850-51	Poona Irregular Horse	224	95	—	—	—	9	—	1	—	17	1	—	—	—	—	142	—	264	1	117·8	0·4
1851-52		231	71	—	—	—	5	—	2	—	16	1	2	—	9	3	123	—	228	4	98·7	1·0
1852-53		282	46	—	—	—	6	—	—	—	10	—	3	1	—	—	113	—	178	1	63·1	0·3
1853-54		334	51	—	—	—	7	—	1	—	17	—	4	—	—	—	143	1	223	1	66·7	0·5
1854-55		359	19	1	—	—	2	—	1	—	12	2	1	—	7	2	71	2	113	7	31·4	1·9
1855-56		350	33	1	—	—	7	1	—	—	11	1	3	—	—	—	55	—	109	3	31·1	0·8
1856-57		191	16	—	—	—	2	—	—	—	5	—	—	—	2	1	42	1	67	2	35·0	1·0
1857-58		337	58	1	—	—	7	1	2	1	9	1	—	—	—	—	131	5	207	9	61·4	2·6
1858-59		247	31	—	—	—	2	—	1	—	4	—	—	—	—	—	105	1	143	1	57·8	0·4
1859-60		358	45	—	1	—	10	—	—	—	11	—	1	—	1	1	120	—	189	1	52·7	0·2

By order of the Acting Principal Inspector-General, Medical Department,
W. C. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay, 27th July 1860.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1, 2. No building has been specially erected as an hospital. The building used for this purpose is a detached bungalow in the centre of the camp, about 400 yards from the horse lines, and about 600 yards from the bazaar and houses of the civil population. The site is open and freely ventilated. There are buildings near, but which are not so situated as to interfere with a free current of air to the hospital. The site is generally healthy as to elevation and drainage, and quite free from malaria from river banks, &c., or other nuisances. 3. There is an abundant supply of good and wholesome water from two wells situated in the enclosure. 4. All impurities from the hospital are removed by sweepers as often as necessary. 5. The hospital contains only one ward, which is raised about 18 inches above the ground. No special provision is made for carrying off the roof water, but the greater portion is carried away by the natural slope of the ground, which also admits of the surface drainage being carried away without obstruction. The building is constructed of kiln-burnt bricks, and has single walls and thatched roof, which is sufficient to keep the hospital cool under ordinary circumstances. A verandah six feet in breadth runs all round, which affords sufficient shelter from the sun's rays, and the enclosed portions of which are occasionally used for the accommodation of sick or convalescents. The hospital consists of one flat only. It receives the full benefit of the prevailing winds. The windows open inwards from the centre, and their arrangement and construction is quite conducive to ventilation and coolness. 6. The ventilation of the wards is effected by means of open doors, windows, and jhilmils, which keep them cool at all times and free of odour or closeness. The jhilmils are those commonly used in India. 7, 8. There is no apparatus for cooling or warming the wards. The walls and ceilings are cleansed and limewashed whenever necessary. 9. There is one privy, of the simplest construction, situated to the rear of and detached from the hospital. It is not supplied with water, but is never offensive, being cleaned by sweepers as often as used. 10, 11, 12. There are no lavatories or means of bathing the sick; neither are there any means for washing and drying the hospital linen. 13. The storage is sufficient and dry. 14. The bedsteads used in the hospital are common wooden charpoys, laced with broad tape. The bedding, &c. is supplied by the patients themselves. 15, 16, 17. No reply to these queries, as they refer to European hospitals only. 18. The sanitary condition of the hospital is good. No hospital gangrene or pyæmia have, so far as I am aware, ever occurred. 19. I am not aware of any deficiencies or sanitary defects which call for improvement. 20, 21. Apply to Europeans only. 22. There are no special local hospital regulations not included in the General Presidency Medical Regulations. 23. The medical officer has entire control over all matters connected with the hospital arrangements, subject to the approval of the superintending surgeon of the division. 24. There is no convalescent hospital nor any wards for that purpose into which a soldier can pass until he is fit for duty.
XIII. Burial of the Dead.	1. The burial ground is about 400 yards from the camp boundary, and to leeward of the station. 2. It is about an acre in extent, with a hard and rocky soil. There is a hedge and deep drain all round it, and the enclosure is carefully kept. 3. There are no regulations as to grave space, depth of graves, reopening them, and times of burial, no British troops being now quartered at the station. The native burial grounds are outside the camp limits, and are under the civil authorities. 4. The graveyard is never offensive. 5. The dead of camp followers and bazaar people are disposed of according to the customs of the country and under civil regulations. 6, 7. No injury accrues to the public health from the present practice, and no improvement could be suggested without interfering with the native prejudices.

(Signed) R. M. Westropp, Captain commanding at Seroor, and President.

Members. A. V. H. Finch, Captain Engineers.
William E. Cates, Assistant-Surgeon, Poona Irregular Horse.
R. Thorpe Tragett, Lieutenant, Acting Adjutant, Poona Irregular Horse.

30th June 1860.

VINGORLA.

Accommodation—Native Troops—Infantry—Sawunt-Warree Local Corps 180, of all ranks.

Reference to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the surrounding country is very picturesque from the Wharf. A chain of low hills range in a N.N.E. direction, and extend within 500 yards of the town, and outside of camp as far as "Ruree," a fortress about 9 miles in a W.S.W. direction. The country is hilly and dry, with lofty fruit trees indigenous to the country, such as jack, cashew, cocoa-nut, and mangoe. There is no jungle, but several springs in the vicinity of the station. 2. The elevation of the station above the sea is about 20 feet, about 5 feet above the adjacent

VINGORLA. BOMBAY.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	country. There is a chain of low hills running in a N.N.E. direction from the Wharf to within about 500 yards from the town and a mile of the cantonment; with the exception of these hills there is no ground higher or healthier adjoining the station. 3. The nearest table land is 5 miles off, but it possesses no advantages either in a military or sanitary point of view. 4. With regard to the nearest water, the river Sawkoo is about ½ a mile distant, and the sea about 2½ miles from the station. The water in the rainy season runs off very rapidly. There is no broken ground within some distance of the station. 5. The station is well exposed to the sea breeze, which is highly salubrious, and no impediment exists to its free circulation. The temperature of the station is not raised by reflected sun heat. The sea breeze which is diurnal and salubrious is the prevailing wind in the year. The land wind from the E.N.E. is usually of short duration and not prejudicial at the station. 6. The cultivation of rice is constantly in progress in the vicinity of the town, fresh water being always procurable; no other cultivation seems so desirable as this for the inhabitants. It does not seem to have any injurious effect upon the health of the station. There are no works of irrigation. Rice is cultivated within 500 yards of camp duing the monsoon, but at no other period of the year so close. Indigo is not cultivated. Hemp is prepared in the native town, but not to any great extent. No injury to health appears to arise therefrom. 7. The town of Vingorla is situated about 1½ miles from the station. 8. The geological structure of the hilly range, which commences from the wharf, is of moorum and rocky; the subsoil and surface is feruginous sand; the station has always occupied the same ground. 9. The depth below the surface at which water is found depends upon the elevation of the ground. The depth of the hospital well is 45 feet, and the well near the native lines only 35 feet. 10. The rain-fall flows off very rapidly into a rivulet which empties itself into the sea. The station being surrounded by hills, the drainage from them necessarily passes into the subsoil of the station. 11. The water supply of the station is derived from wells. There are no tanks within half a mile of it. The river near the town is used for bathing and washing linen. When the water of the river is low and stored up in small pools nuisance occasionally proceeds from it, but does not affect the health of the station, as it only exists for about two months of the year before the setting in of the monsoon. 12. The water supply is abundant for all purposes except drinking. Excellent drinking water, however, is procurable from a spring near the Wharf. The water from wells is hard, and from its being impregnated with iron cannot be unwholesome, although not so agreeable to the taste as that procurable from the Wharf. The amount is sufficient; it is raised by leather buckets, which appears to be the best for all purposes. 13. There are no other topographical points bearing on the health of the station not included in the above replies. 14. I cannot suggest any improvements in the mode of selecting new stations.
II. CLIMATE.	1. The only means and instruments available for conducting and registering meteorological observations at the station are a thermometer and a pluviometer. 2. The following table gives the result of the observations for one year.

Year's Observations from 1st January to 31st December 1857, at the Station of Vingorla.

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun's Temperature.	Rain.	Wind.		Days of Sunshine.	Remarks as to Clouds, Dew, Wind, Storms, &c.
										Direction.	Force.		
									Inches.				
January	—	77·22	12·16	83·32	71·12	—	—	90·09	—	N.E. & W.	Moderate	31	
February	—	77·14	14·00	84·21	70·07	—	—	95·53	—	N.E. at 6 a.m., and W. at 1 p.m.	Ditto	28	
March	—	79·81	11·19	85·41	74·22	—	—	97·55	—	Ditto	Ditto	31	
April	—	81.49	10·63	86·66	76·33	—	—	101·13	—	N.W. & W.	Calm	30	
May	—	83·12	4·16	85·70	81·54	—	—	97·16	18·2	N.W. & S.W.	Stormy	23	The S.W. monsoons.
June	—	81·15	7·50	84·90	77·40	—	—	85·80	34·89	S.W. & S S.W.	Ditto	—	
July	—	78·72	7·83	82·64	74·80	—	—	89·25	46·49	Ditto	Ditto	—	
August	—	77·72	2·22	78·83	76·61	—	—	82·00	25·92	Ditto	Ditto	20	
September	—	77·86	3·80	79·76	75·96	—	—	81·12	4·67	West & W.S.W.	Ditto	16	
October	—	81·27	4·03	83·29	79·25	—	—	84·93	3·46	Westerly	Ditto	19	
November	—	80·45	8·10	84·50	76·40	—	—	85·13	·25	Easterly & Westerly.	Fresh	27	
December	—	80·22	11·19	85·83	74·61	—	—	84·41	—	N.E. & W.	Ditto	31	

3. There is no considerable variation in the climate. It is never very cold, and the heat is moderate, but from heavy dews it is occasionally damp at night. The air is never rendered impure by any extraneous matter, owing doubtless to the daily setting in of the sea breeze. The health of the troops is generally excellent. Morning and evening exercise is very desirable for them, except during the hot months, when once a day is sufficient. The station is considered healthy at all times of the year.

4. There is no district near the station more healthy than the camp.

5. I have served at Poona, Nusseerabad, Neemuch, Kurrachee, Mulligaum, and Sawunt Warree, and found them all conducive to health, with the exception of the last named.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station.	1, 2. A sketch of the camp is forwarded. 3, 4, 5, 6. There are no barracks at the station. The hospital, which is a large commodious building, has on several occasions been used as a barrack, and for the accommodation of convalescent European soldiers from up-country stations, during which time a temporary building, constructed near the hospital, has been used for the sick. 7. No tents are used in camp. 8. The new lines are ventilated by an aperture of about 1 foot left between the top of the walls and the roof of the huts, which is sufficient for the natives. There are no means of cooling the air. 9, 10. The huts are built of mud with jungle wood roofs single tiled. The doors are of mangoe wood; they have no windows. The floors are raised about 1½ feet above the ground, and are constructed of moorum, watered and well rammed. 11. The materials of which the lines are constructed are most suitable for the climate, and they are usually kept in repair by the engineers' department. There is no cantonment at Vingorla; it is at present a civil station. 12, 13. No lavatories required for natives. All linen is usually washed at the river near the native lines. 14, 15, 16. The contents of the privies are removed by the sweepers. There are no cess-pits or foul ditches. 17. The station being a very small one there is little or no refuse, but what there is is usually burnt. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls or thick hedges, &c. interfering with the ventilation of the station or bazaar. 19. The station bazaar consists of a few shops, and the occupant of each house is required to look after the cleanliness of that part of the bazaar adjacent to his dwelling. There are few native houses within ½ a mile of the station, and their average condition is good. There are no dung heaps or cess pits; no nuisance is experienced from wind blowing over the native dwellings. 20. Animals are seldom slaughtered in the camp, and the slaughtering places are in the town, consequently too far distant to cause any nuisance. 21. Horses are very rarely picketed in camp. 22. There are no stables or picketing grounds for artillery or cavalry horses. 23. There are only two non-commissioned officers, and they do not live in camp. One of them has quarters in the depôt arsenal, and the other has a small house close by.
Officers' Quarters.	There are five bungalows for officers, two only of which are occupied by residents. They are situated in a healthy locality, and most of them being built on the side of the hill the water runs off easily. No improvements are suggested.
IV. Health of the Troops.	1. The station, district, and adjoining native population are generally very healthy. 2. Epidemics seldom prevail among the natives; spleen disease never. A few cases of cholera have occurred, but it is a very rare occurrence. 3. The healthiness of the native population is attributable to the diurnal change of the wind to west-south-west or west-north-west, which is open to the sea. 4. The detachment of the local corps at this station arrived here in February 1859 from Sawunt Warree. All accommodation for the men at this station is in a healthy locality. 5. The men remain in their lines all the year round. 6. I have never been in charge of troops at a hill station, but I have spent a hot season at the Mahableshwur hills, which I found highly beneficial to my health. 7, 8. I approve of hill stations for troops during the hot months. 9. I have known instances of hill stations proving fatal to people subject to liver disease. 10. I am not aware of any precautions as to diet, &c., which would guard men from attacks of disease, and enable them to obtain greater benefit from residence in hill stations. 11. The period best adapted for residence in hill stations is from 1st March to 31st May, which is the shortest period to obtain benefit from such residence. 12. If troops reside at hill stations during the cold season, and then return during the hot months to the plains, it is likely to prove injurious to their health. 13. The special precaution necessary on leaving hill stations for the plains is to avoid exposure to the sun as much as possible. 14. Service in the plains during the rainy and cold seasons, and change to the hills during the hot months, would be equally conducive to the health of Europeans as to locate them for lengthened periods on hill stations. This latter plan renders them less able to resist the effects of the heat when necessity obliges them to bear it. Change of station on the plains every three or four years is beneficial to the health and spirits of troops and convalescents. 15. I am not aware of any deficiencies in the accommodation for troops at hill stations. 16. No experience. 17. Although the range of hills from the Wharf is a very desirable place for health, yet the plains now occupied are exposed freely to the same salutary influences. 18. No experience. 19. Soldiers proceeding to India should be about 16 or 17 years of age, and should land there in November or December. Recruits should be provided with good solar hats and kept as much as possible out of the sun. 20. It would be very desirable to send troops for India to an intermediate station for a certain time, and on landing in India they should be gradually accustomed to the climate by being sent to the best stations. 21. Troops usually arrive at this station by sea, the Europeans in steamers and the natives in country boats. Troops ought never to march in the hot weather except in cases of the greatest emergency. 22. About 20 years is the period a British soldier should serve in India, with an intermediate furlough after ten. 23. I have no suggestions to make in regard to invaliding by medical boards. 24. Invalids should leave India for home about December or January.
Diseases.	1. Regular inspection parades are made of all the men at the station whenever any syphilitic cases are admitted into hospital. 2. I have never known any case of scorbutic disease among the troops at this station. 3, 4. No cases of hepatic disease or dracunculus have occurred.

VINGORLA. BOMBAY.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	5. The proportion of constantly sick from venereal diseases is annually 0·58 to total admissions of 101 from all other diseases. 6. The troops at the station suffer from the following diseases: *Fevers.*—Ephemeral, continued, and remittent fevers, usually of a mild description. *Cholera.*—As an epidemic very rare. A few cases have occurred during the rainy season. *Smallpox.*—A case seldom occurs except as an epidemic. *Rheumatism* is a very rare disease at this station. The proportion of admissions from cholera for the past year was 2·97, and two deaths to one cured of this disease. No casualty from all other diseases occurred. 7. Diseases of a zymotic character have not shown themselves at this station. The sanitary condition generally of the native dwellings is remarkably good, cleanliness and ventilation in the men's lines being strictly attended to. I am not aware of any habits or conditions among the troops or population which predispose to diseases. 8. Native soldiers exposed on duty are not rendered more liable to contract epidemic disease. 9. Quinine has not been tried as a prophylactic, as there is no malarial disease prevalent at the station. 10. I have no recommendations to make on any of the preceding points.
V. INTEMPERANCE.	1. There are no European soldiers at the station, and the natives are usually very temperate. There are no confirmed drunkards. 2. There have been no admissions into hospital from diseases caused directly or indirectly by intemperance. A case of drunkenness rarely occurs, but when it does the offender is punished. 3. Spirits are not procurable except at the European shops, and there is an order against selling distilled spirits to soldiers. When recommended by the medical officer arrack is occasionally administered to convalescents. Toddy and arrack are procurable in the native town. 4. There is no consumption of spirits by troops, and that consumed by convalescents is at the recommendation of the medical officer. 5, 6. There is no occasion for abolishing the use of spirits at this station. 7, 8, 9, 10. Coffee, tea, lemonade, &c. are not used by native soldiers. 11. There are no bazaar regulations.
VI. DIET.	1 to 4. There queries do not apply to native troops. 5. Soldiers' gardens could be advantageously established near the station, as there is plenty of ground in the cantonment available for the purpose. They should be under the order of the officer commanding and the sanction of the civil authority.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress here consists of a dark-green cloth coat, dark blue turban, and black accoutrements. They are very suitable for natives. I could not suggest any improvement in the dress for natives. The men are supplied each with a cumlie or blanket of dark colour which they make use of in wet weather.
Duties.	1. I should consider it very advisable to drill men before sending them out to this country. 2, 3. No reply to these queries.
VIII. INSTRUCTION AND RECREATION.	No means of instruction or recreation exist at this station.
IX. MILITARY PRISONS.	There are no military prisons.
X. FIELD SERVICE.	No information under this head.

XI. STATISTICS OF SICKNESS AND MORTALITY. EUROPEAN TROOPS.

Years.	CORPS.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per cent. to Strength. Treated.	Ratio per cent. to Strength. Died.
	QUEEN'S TROOPS.																					
1858-59	Detachment H.M.'s 56th Regt.	22	7	1	—	—	2	—	—	—	13	—	—	—	—	—	17	—	39	1	177·2	4·5
	EUROPEAN TROOPS IN THE INDIAN ARMY.																					
1850-51	Detachment 2nd Regt. European Light Infantry	40	3	—	—	—	3	—	6	—	12	1	—	—	—	—	29	1	53	2	132·5	5·0
1851-52	Detachment 3rd Co. 1st Battn. Artillery Detachment 2nd Regt. European Light Infantry	67	6	—	—	—	5	2	1	—	9	2	9	1	—	—	56	1	86	6	128·3	9·0
1852-53	Detachment 3rd Co. 1st Battn. Artillery Detachment 2nd Regt. European Light Infantry	30	23	—	—	—	4	1	9	—	5	1	7	—	—	—	70	3	118	5	393·3	16·6
	NATIVE TROOPS.																					
1850-51	Detachment 4th Reg. Nat. Inf. Do. 9th do. do.	272	29	—	—	—	1	—	—	—	4	—	2	1	—	—	35	—	71	1	26·1	0·3
1851-52	Do. 9th do. do.	243	37	—	—	—	—	—	—	—	13	—	—	—	—	—	82	—	132	—	54·2	—
1852-53	Do. 5th do. do. Do. 9th do. do.	206	44	—	—	—	2	—	1	—	15	1	—	—	—	—	54	—	116	1	56·3	0·4
1853-54	Do. 9th do. do. Do. 29th do. do.	145	45	—	2	—	5	—	1	—	25	—	4	—	—	—	80	—	162	—	111·7	—
1854-55	Do. 20th do. do. Do. 29th do. do.	171	32	—	1	1	8	—	1	—	19	—	1	—	—	—	56	—	118	1	69·0	0·5
1855-56	Do. 20th do. do. Do. 28th do. do.	217	29	—	3	—	4	—	—	—	30	1	1	—	—	—	78	—	145	1	66·8	0·4
1856-57	Do. 20th do. do. Do. 29th do. do.	240	44	1	—	—	—	—	2	—	19	—	1	—	—	—	75	1	141	2	58·7	0·8
1857-58	Do. 15th do. do.	176	39	2	3	—	4	—	—	—	34	—	3	—	1	1	59	—	143	3	81·2	1·7
1858-59	Do. 15th do. do. Do. 20th do. do.	138	17	—	—	—	1	—	—	—	23	—	—	—	—	—	55	—	96	—	69·5	—

By order of the Acting Principal Inspector-General, Medical Department.

Office of the Principal Inspector-General, Medical Department, Bombay, 9th November 1860.

W. C. COLES, Assistant Surgeon, Secretary.

References to Subjects and Queries.	Replies.
XII. Hospitals.	1, 2. The hospital is situate about 500 yards from the men's lines, and on the east side of the camp. It is near the officers' bungalows, and about 600 yards from the bazaar. The site is on an elevation, and the building is freely ventilated, nothing being near enough to interfere with ventilation. It is very good in every respect. 3. The water is wholesome, but the hospital well is at present being deepened, which will greatly improve the water-supply. 4. The refuse water about the hospital is very limited. All impurities are carefully removed by the sweeper daily, and thrown into a ditch about 300 yards distant. 5. The height of the lowest ward above the ground is about 4 feet. There is no perflation of air underneath the floors. The hospital being on a slope, the roof water runs off rapidly into the nullahs. A small drain is dug round it which is found quite sufficient for drainage. The roof of the hospital is double tiled, and the walls, which are 2 feet in thickness, are built of stone and lime, but have no ventilation between them. There are verandahs on both sides 10 feet in breadth, which afford sufficient shelter from the sun's rays. These have never yet been used for the accommodation of sick, convalescents, or others.

Table of Hospital Accommodation.

Total No. of wards - - - - 2
Total regulation No. of beds - - - 18

Wards, Number.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number	Height.	Width
		Ft.	Ft. in.	Ft.			Feet.			Ft.	Ft.
No. 1. -	6	32	22 6	18	10,440	1,740	120	1 6	6	6	4
No. 2. -	12	60½	22 6	18	19,738	1,644⅚	113⅝	1 6	12	6	4

	The hospital is so placed as to receive the full benefit of the prevailing winds. The glass windows are so placed as to admit wind from all quarters, and perfect ventilation is thereby preserved, together with coolness. 6. The means of ventilation are by large windows and doors, which are quite sufficient to keep the wards cool and free of odour at all times. There are no jalousies or jhilmils. 7, 8. There are no artificial means of cooling or warming the wards. The walls and ceilings of the wards are cleansed and limewashed annually, and oftener if necessary. 9. The contents of the privies being removed by the sweeper, they are not offensive. 10, 11. There are no lavatories at the hospital. The natives usually bathe by throwing a small quantity of water over themselves. 12. Natives wash their own linen, and when sick a comrade does it for them. 13. The storage is sufficient and dry. 14. Wooden cots laced with cotton tapes are used in the hospital. No improvement upon this can be suggested. 15. The hospital kitchen is chiefly used by natives, and they supply their own apparatus for cooking. 16. No hospital diet is as a rule adopted for native sick by Government. 17. The attendance for native sick consists of a goorgah, bheestie and sweeper, which is found ample. 18. The sanitary condition of the hospital is generally excellent. No epidemic diseases have been known to appear in any of the wards. 19. No improvements are suggested. 20. The convalescents are permitted to take exercise morning and evening round the hospital. 21. No special provision is required at this station for the treatment of soldier's sick wives and children, as the present arrangements are perfectly ample for any emergency. 22. No special local hospital regulations exist which are not included in the general presidency medical regulations. 23. The medical officer is free to prescribe any medical comforts for the sick under his care, but repairs to the building, or any sanitary improvement requiring an outlay, must be submitted for sanction to a higher authority. 24. There are no wards or hospitals for convalescents, nor are any required at this station.
XIII. Burial of the Dead.	1, 2. The burial-ground is well sheltered from the station by an high hill which intervenes. The ground is small, being about 100 yards by 80, much neglected, and contains less than a dozen graves. The soil is of moorum and rock. 3. There are no regulations with regard to the grave space allowed or the interval between each: they are about 8 feet in depth. I have never heard of one being reopened. Interment takes place at ordinary times, about 24 hours after death, but during epidemics with as little delay as possible. There are no burial-grounds used by natives within 500 yards of the camp. 4. The grave-yard is never offensive. 5, 6. The dead of Mahomedans are buried near the native towns. The Hindoos mostly burn their dead. No injury occurs from the above practice. 7. The only improvement I can suggest is, that the present burial-ground used by British troops be walled in, and the tombs repaired annually.

(Signed) G. R. C. Westropp, Lieutenant
Commanding at Vingorla.
Lewis George, Apothecary
in medical charge of Vingorla.
Robert Moore, Sub. Cond.,
Assistant Supervisor,
D. P. Works.

26th May 1860.

RUTNAGHERRY.
BOMBAY.

RUTNAGHERRY.

Accommodation.—Native Infantry, 3 full companies.

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the country surrounding the station is as follows: A sea-coast line of low hills with flat summits, with bare open rocky country inland. It is hilly, consisting of irregular rocky plateaux, broken into ravines and valleys; these hills are thinly covered with scrub. There is a scarcity of fresh water, but numerous springs. 2. The elevation of the station is 150 feet above the sea, but it is on a level with the adjacent country. The nearest water to the station is the sea and the salt water creeks N. and S. There is no higher nor healthier ground adjoining the station. 3. The nearest mountains are the Syndree range of Ghauts, at a distance of 30 miles, which are about 3,000 feet above this level. 4. The nearest water is on the sea-coast; the salt water creeks become muddy swamps at low tide. The vicinity is not liable to overflow. Ravines are numerous in the vicinity of the station, but health is not affected by them. 5. The station is very open, and there is nothing to interfere with free ventilation. The buildings are so few in number that no increase of temperature results from reflected sun-heat. The station is open to all winds. The land winds during the cold season are apt to cause rheumatism; the sea breezes in the hot season are healthy, but the damp winds in the monsoon produce bowel complaints. 6. The surrounding country is generally uncultivated, and works of irrigation are not in existence near the station. Rice is grown in quantities in the low ground near the coast, but indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. 7. The town of Rutnagherry contains about 10,000 inhabitants, and adjoins the station. 8. The geological structure is of laterite, resting on trap. The station is on new ground. 9. Water is usually found, both in the dry and rainy season, at a depth of from 30 to 40 feet below the surface. 10. The rainfall in the district flows readily away,—it does not lie on the surface till evaporated. There is no higher ground near. 11. The water supply of the station is derived from wells and springs. There are no tanks. The wells are generally covered over, and no nuisance or malaria is experienced from them. 12. The wells and springs are sufficient for the demand. The water is free from taste and smell, is soft like rain water, and very good. It is raised by buckets and "lotas." None better could be had. 13. There are no other topographical points bearing on the health of the station not included in the above queries. 14. With reference to the selection of new stations the chief considerations seem to have been of a political nature, without reference to sanitary arrangements, and we would suggest that some regard be paid to these before erecting permanent barracks for troops.
II. Climate.	1. The only instruments for conducting meteorological observations at this station are the thermometer and rain-gauge. 3. The heat of the hotter months is moderated by fresh northerly sea-breezes. The climate is damp during the monsoon, and dry in the forenoon during the prevalence of land winds, from November to February. The climate may be described as generally moist, warm, and relaxing, with an annual range of about 20°, and diurnal not exceeding 12°. It is not affected by tree planting nor irrigation, nor by dust and other admixtures affecting the atmosphere. Protracted residence here would induce enervation, and render Europeans liable to sickness on transfer to other parts, where the climate is more variable. Europeans are not more affected in one month than in another; but natives suffer from fever and rheumatism in the cold season. 4. There is no district near the station the climate of which would be more conducive to health than that of the station. 5. The districts of which the Committee is able to speak from experienceare, Guzerat, Deccan, the Concan and Southern Mahratta country. Of these Goozerat is certainly the most injurious to the health of Europeans, and the Deccan the most favourable.
III. Sanitary Condition of Station.	1, 2, 3. Plans of the station and surrounding country, &c., are transmitted. 4. Table of Hut Accommodation. Date of construction of huts, 1859–60. Total number of huts - - - - - - 222 Total regulation number of non-commissioned officers and men - 235

Huts.	Regulation Number of Men in each Hut.	Dimensions of Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.						Ft. In.	Ft. In.
2 huts allotted to N.C.O.	—	10	8	7½	600	—	80	—	—	—	—
1 hut to each private.	—	—	—	—	—	—	—	—	One door in front and one in rear to each hut.		
1 Guard-room -	Quarter guard -	17	11	10¼	2,337½	—	—	—	1	2 4	2 2
1 Prison cell -	Attached to quarter guard.	11	7½	10¼	845½	—	—	—	1	2 4	2 2

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	5 to 8. No barracks at this station. 9, 10. The huts are constructed of stone and mud with tiled roofs. The floors are level with the ground. 11. The materials and construction of the huts are in every respect suitable for the climate. Rutnagherry is a civil station. The public buildings are kept in repair by the executive engineer of the district. 12 to 15. No replies. 16. There are no foul ditches near the station. 17. No answer to this question. 18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c., interfering with the ventilation of the station. 19. There is no military bazaar here. The native houses in the town are under the surveillance of the Civil Department. 20 to 23. There are no European soldiers at Rutnagherry.
Officers' Quarters.	1. No reply.
IV. Health of the Troops.	1. The population in the adjoining town is very healthy. 2. The town and station of Rutnagherry is remarkably free from cholera; but it is frequent in the districts adjoining. Lumbricus is an endemic disease, accounted for by the absence of lime in the water, and the vegetable diet. 3. The healthiness of the native population is attributable to the purity of air and water as regards the town and station, and in the districts disease is produced by the close confined localities of villages, added to insufficient diet. 4. Troops have been permanently located at Kolapore and suffered chiefly from guinea worm, which has gradually disappeared since their arrival here in December 1858. No part of the men's present accommodation is, I believe, more unhealthy than the rest. 5, 6. Troops are never camped out. I have never been in charge of troops at hill stations. 7 to 13. No experience of hill stations. 14. Frequent change of station on the plains is beneficial to the health of troops. 15, 16. No experience to enable me to answer these questions. 17. There is no higher ground very near the station that could be advantageously occupied as a hill station. 18. Rocky soil in India undoubtedly has the advantage over all others for sites of stations. 19. I am not sufficiently experienced to offer an opinion as to the best age for soldiers to proceed to India, but they should land here in the cold season. 20 to 24. No experience to enable me to answer these queries.
Diseases.	1. There are no inspection parades here for the discovery of incipient diseases. 2, 3. There has been no case of scorbutus or hepatitis at this station, and the natives are not subject to hepatic disease on the sea-coast. 4. Dracunculus is not an endemic of Rutnagherry. Sufferers generally recover from this disease, contracted before their arrival here. 5. There are no European soldiers here, and the natives usually are treated by native doctors for venereal disease; no fair proportion as to the amount of venereal disease can be stated. 6. The following are the more prevalent diseases at the station:— *Fevers.*—Simple intermittent fever, generally connected with functional derangement of the liver. *Dysentery.*—In a mild form as above. *Rheumatism*—occasionally, but the proportion is insignificant. No proportion which admissions and deaths from the above diseases bear to the total admissions and deaths can be stated. Fatal cases are very rare, and intermittent fever only proves fatal when complicated with internal congestion. 7, 8. Zymotic diseases are unknown here. 9, 10. Small doses of quinine, as a prophylactic against malarial disease, have not been administered at this station.
VII. Dress, Accoutrements, and Duties.	1. The dress in use at this station is as follows:—Tunic, linen pantaloons, forage cap, half-boots for sepoys, pouch and belt, waist-belt, knapsacks and slings. This applies only to natives, there being no European soldiers at Rutnagherry.
Duties.	No information under this head.
VIII. Instruction and Recreation.	There are no European troops at this station, consequently no information on this head can be afforded.
IX. Military Prisons.	1. There is one cell only attached to the Native Infantry Quarter Guard, and this is in every respect well adapted to the purpose required.
X. Field Service.	1. There are local regulations for field medical service, not included in the General Presidency Regulations. 2. There are no medical officers attached to the detachment of troops here. 3. The medical officer has little to do with the troops at this station, except in hospital. The huts are few in number, and well ventilated. The troops belong to a local corps. 4. No answer to this question.

RUTNAGHERRY. BOMBAY.

References to Subjects and Queries.	REPLIES.
XI. STATISTICS OF SICKNESS AND MORTALITY.	RUTNAGHERRY.

Year.	CORPS.	Strength.	Fevers.		Eruptive Fevers.		Diseases of the Lungs.		Diseases of the Liver.		Diseases of the Stomach and Bowels.		Diseases of the Brain.		Epidemic Cholera.		All other Diseases.		Total.		Ratio per cent. to Strength.	
			Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.	Treated.	Died.
	EUROPEAN TROOPS IN THE INDIAN ARMY.										EUROPEAN TROOPS.											
1857-58	Detachment 2nd Company 2nd Battalion Artillery - - Detachment 2nd European Regiment Light Infantry -	40	20	—	—	—	—	—	3	—	4	—	2	—	—	—	26	—	55	—	137·5	—
1858-59	Detachment 2nd European Regiment Light Infantry -	11	3	—	—	—	—	—	2	—	3	—	1	—	—	—	12	—	21	—	191·0	—
											NATIVE TROOPS.											
1850-51	Detachment 4th Regiment Native Infantry - - -	296	7	2	—	—	5	—	—	—	29	1	—	—	—	—	128	—	232	3	78·3	1·0
	Do. 9th do. -																					
1851-52	Do. 4th do. -	286	88	—	1	—	2	—	—	—	25	—	5	—	—	—	135	—	256	—	89·3	—
	Do. 9th do. -																					
1852-53	Do. 4th do. -	261	44	—	—	—	3	—	—	—	23	—	2	—	—	—	80	1	152	1	58·2	0·3
	Do. 9th do. -																					
1853-54	Do. 4th do. -	248	51	—	—	—	1	—	—	—	24	2	2	—	—	—	102	—	180	2	72·4	0·8
	Do. 5th do. -																					
1854-55	Do. 5th do. -	248	36	—	—	—	—	—	—	—	18	1	2	—	—	—	127	—	183	1	73·7	0·4
	Do. 29th do. -																					
1855-56	Do. 27th do. -	247	44	—	—	—	3	1	—	—	26	—	1	—	—	—	56	—	130	1	52·6	0·4
	Do. 29th do. -																					
1856-57	Do. 27th do. -	229	51	1	2	—	2	—	—	—	44	—	2	1	—	—	113	1	214	3	93·4	1·3
1857-58	Do. 27th do. -	226	32	—	2	—	7	1	—	—	29	1	2	—	—	—	89	1	161	3	71·2	1·3
1858-59	Do. 15th do. -	92	15	—	3	—	2	—	—	—	24	—	—	—	—	—	34	—	78	—	84·7	—
	Do. 27th do. -																					

By order of the Acting Principal Inspector-General Medical Department,
W. C. COLES, Assistant Surgeon,
Secretary.

Office of the Principal Inspector-General, Medical Department,
Bombay 5th September 1860.

XII. HOSPITALS.

1. A plan of the hospital at Rutnagherry is transmitted.
2. The hospital is about 10 minutes' walk from the sepoys' lines, and the same distance in a southerly direction from the native houses. There is a high wall round it; but it is well adapted for a native hospital. The site, generally, as regards the elevation, drainage, absence of malaria, &c., is healthy.
3. The water supply is abundant and wholesome.
4. No means of drainage for the removal of refuse water and other impurities from the hospital, but sweepers for this purpose are employed.
5. The floors of the hospital wards are of earth, and raised two feet above the ground. The roof water sinks into the subsoil: the drainage of the hospital generally is good. The hospital is built of stone, with a tiled roof, and is cool. There are verandahs on both sides of the hospital of about six feet in breadth, but they are never used for the accommodation of sick, convalescents, or others. The hospital consists of a ground floor only.

Table of Hospital Accommodation.

Date of construction—about 40 years ago.

Total number of wards—1 large ward and 2 small rooms.

Total regulation number of beds } - - - - - 17
Cots in charge at present only }

Number of Wards or Hospital Huts.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.		Feet.	Feet.
Large ward -	40	80	20 3/4	13 3/4	22,825	570	41	1 1/2	14	4 1/2	3 1/4
Small ward -	4	16 1/2	20 3/4	13 3/4	4,707	1,177	85 1/2	1 1/2	2	4 1/2	3 1/4
Do. -	4	16 1/4	20 3/4	13 3/4	4,634	1,158 1/2	84 1/4	1 1/2	3	4 1/2	3 1/4

The hospital is so placed as to receive the full benefit of prevailing winds. The windows are in two frames, and open outwards, and are conducive to ventilation.

6. The means of ventilation are the doors and windows, usually kept open. The wards are free of closeness or odour. There are no jalousies or jhilmils.

7, 8. No means for either cooling or warming the wards are used. The walls and ceilings of the wards are cleansed and lime-washed annually.

9. The privy is in one corner of the enclosure apart from the hospital, and consists of three partitions. Sweepers are employed to cleanse it daily.

10 to 13. No answers to these questions.

14. The cots are simple frames over which broad tape is stretched, and this forms the bedding. Nothing better could be devised.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	15, 16, 17. These queries are applicable to European troops only. 18, 19. The hospital is very healthy, and no epidemic disease, hospital gangrene, or pyœmia, have appeared in its wards. No improvements are suggested. 20, 21, 22. No replies to these questions. 23. Every recommendation of the medical officer, as regards the sanitary state of his hospital, diet, medical comforts, &c., is attended to. 24. There is no ward for convalescents at this station.
XIII. Burial of the Dead.	1, 2. There is a small enclosure half a mile from the station used as a burial ground. Its soil is rocky concrete, and subsoil trap. 3, 4. There is no burial ground for Hindoos, but there is one for Mussulmans near the European burial ground. It is never offensive. 5. The dead of bazaar people are disposed of according to caste; Hindoos are burnt, and Mussulmans buried. 6, 7. No injury whatever accrues to health from the present practice, and no improvements in respect to disposal of the dead can be suggested.

(Signed) C. A. S. Milton, Lieutenant,
Commanding Detachment Kol. Infantry.
Eyre de Crespigny, Assistant Surgeon,
Civil Surgeon.
Edward Holland, Lieutenant,
Executive Engineer, S. Concan.

30th June 1860.

Replies to Questions issued by the Royal Commission on the Sanitary State of the Indian Army, made by Dr. B. P. Rooke, Principal Inspector-General, Medical Department, Bombay Presidency.

References to Subjects and Queries. | Replies.

No. 1.—A List of all the Stations in each Presidency, arranged according to their order of salubrity, with notes on the general sanitary condition of each.

The following are the principal stations for European troops in the Bombay Presidency:—

1. Bombay and Colaba.
2. In the Deccan.—Poona, Kirkee, Ahmednuggur, Sattara, and Sholapore.
3. In the Northern Division.—Deesa, Ahmedabad, Surat, and Baroda.
4. In the Southern Division.—Belgaum.
5. In Sinde.—Kurrachee and Hyderabad.
6. In Malwa and Rajpootana.—Mhow, Neemuch, and Nusseerabad.
7. Aden.

It is only since the mutinies that European troops of the Bombay army have occupied the stations of Mhow, Neemuch, Sattara, Surat, Baroda, and Ahmedabad, and from the two latter places they have been now withdrawn. The statistics of all these new stations, therefore, only extend over three years, whilst at the other places they embrace a decade from 1850 to 1860, as will be seen from the accompanying table, marked A.

Arranged according to their comparative salubrity, as judged of by a minimum of deaths, the several stations stand as follows:—

Stations.	Proportion of Deaths per 1,000.	Proportion of Treated to Strength per Cent.	No. of Years referred to.
Asseerghur	13·5	152·7	3 years, 1858–61.
Kirkee	13·7	166·3	10 „ 1850–60.
Aden	16·7	138·6	„ „ „
Poona	17·3	184·2	„ „ „
Belgaum	17·8	144·3	„ „ „
Sattara	18·9	180·8	3 „ 1857–60.
Deesa	19·5	185·4	10 „ 1850–60.
Ahmedabad	20·8	208·8	3 „ 1857–60.
Sholapore	20·9	245·4	10 „ 1850–60.
Ahmednuggur	27·2	237·7	„ „ „
Kurrachee	27·4	185·6	„ „ „
Mhow	28·4	233·3	3 „ 1857–60.
Hyderabad	28·7	230·6	10 „ 1850–60.
Neemuch	30·3	279·0	3 „ 1857–60.
Colaba	32·0	177·5	10 „ 1850–60.
Nusseerabad	37·8	215·8	„ „ „
Baroda	42·3	260·7	3 „ 1857–60.
Surat	51·7	403·4	„ „ 1857–60.

European troops were temporarily stationed at, for a short time after the mutinies, but have since been withdrawn from, Dharwar, Rutnagherry, Kolapore, Kulladgee, Vingorla, and Malligaum.

No. 1.—Asseerghur. This is a well known hill fort on the borders of Candeish and Rajpootana. It was formerly garrisoned only by native troops, but since the mutinies one or more companies of Europeans have been stationed at Asseerghur. The statistics extend over three years, from 1858 to 1861, and show that the average annual strength has been 74, of which 112 have been treated in hospital, being in the proportion of 152·7 per cent. The number of deaths has been only one

DR. B. P. ROOKE'S REPORT. BOMBAY.

References to Subjects and Queries.	REPLIES.
1. Asseerghur—*cont.*	a year, giving a death rate of 13·5 per thousand. There can be no doubt that it is a very healthy locality for European troops, although the barrack accommodation has been hitherto indifferent. Two new barracks have, however, been lately erected and occupied. The climate is excellent, moderately dry, and not very variable. Fuller details will be found in the separate sanitary report already transmitted.
No. 2.—KIRKEE.	This has been for upwards of a quarter of a century the chief European cavalry station in the Bombay Presidency. It is now occupied by the head quarters of artillery. The annual average strength for the last 10 years has been 802; the average number of sick 1,335, being in the ratio of 166·3 per cent. of treated to strength; the average number of deaths 11 per annum, being a death rate of only 13·7, the lowest rate, with the exception of Asseerghur, of any station in the Presidency! The chief diseases, with their classes and numbers, will be seen in the accompanying table (A). Cholera, it will be observed, has visited the station in 1853 and 1855 and last year. The barracks and accommodation for troops are everything that could be desired. The details with respect to climate and meteorology will be found in the separate sanitary report already transmitted.
No. 3.—ADEN.	This station has been occupied by both European and Native troops of the Madras and Bombay Presidencies since its capture in 1840. The statistics of European troops for the last 10 years furnishes the following results. The average annual strength, consisting of a wing of one of the line or local regiments, with a company of artillery, has been 479; the average number of sick treated has been 664, and the average number of deaths 8. This gives, therefore, an amount of sickness of only 138·6 per cent., being one of the lowest of any station in the Presidency, and a death rate of only 16·7 per thousand. The principal classes of disease will be seen in the accompanying table (A). Cholera, it will be observed, was altogether absent from Aden. The barrack accommodation for the troops is, on the whole, good, and additional barracks are about to be erected.
No. 4.—POONA.	Is a well known station for European troops in the Deccan, within a few hours' reach of Bombay and of the sea coast by rail. The average annual strength of European troops, consisting of horse artillery and infantry, has been 2,191, of which number the admissions into hospital average 4,037, being at the rate of 184·2 per cent. The average yearly number of deaths has been 38, giving a death rate of 17·3 per thousand. The chief classes of disease will be seen in the accompanying table (A). Cholera has been epidemic last year, and in some former years. Weak and delicate soldiers and invalids are sent to the neighbouring sanitarium of Poorundhur, which is easily accessible, and those requiring the air of the sea coast to the Colaba Sanitarium. The new barracks, hospitals, and appliances for troops at this station are of a superior description, and have been made as comfortable and salubrious as possible, and are a great contrast to the old barracks.
No. 5.—BELGAUM.	This has always been a favourite station for European troops in the Southern Division. During the last 10 years, the average yearly strength of European troops has been 1,286, consisting of artillery and infantry; the average number of sick yearly treated has been 1,856, being in the proportion of 144·3 per cent. The number of deaths has been annually 23 on an average of 10 years, making the death rate 17·8 per mille. The principal classes of disease will be seen from the accompanying table (A); and it will be observed that, with the exception of last year, epidemic cholera has been almost entirely absent from the station for the past 10 years. The barracks and accommodation for troops are of a superior description, and the camp is well drained. This station is 2,500 feet above the level of the sea, the climate partaking in some degree of both the N.E. and S.W. monsoons, and very agreeable to the European soldier.
No. 6.—SATTARA.	Sattara has only been occupied by European troops since the mutinies, and the accommodation has been of the most temporary nature. A site for permanent barracks has been chosen contrary to the recorded opinion of the present Deputy Inspector-General of Hospitals of the Poona Division. The statistics only extend, therefore, from the year 1857 to 1860. The average strength of artillery and infantry has been 369, whilst the admissions into hospital have been 667, or about 180·8 per cent.; the average annual number of deaths has been seven, showing a low death rate of only 19 per mille (18·9).
No. 7.—DEESA.	At Deesa, European troops have been long stationed, usually one troop of horse artillery and a wing or an entire European regiment. During the last 10 years the average annual strength has been 769, and the treated in hospital 1,426, being in the proportion of 185·4 per cent. to strength. The annual average number of deaths has been 15, giving a death rate of 19·5 per mille. The chief diseases are fevers, peculiar to Guzerat, from which the mortality is high, but has been reduced somewhat by the severe cases, which would admit of it, being sent to the neighbouring sanitarium at Mount Aboo. The accompanying table (A) will show the chief diseases from which the troops suffer.
No. 8.—AHMEDABAD.	This station was only occupied by European troops since the mutinies in 1858, 1859, and 1860 and they are now withdrawn, with the exception of a company of artillery. The barracks were only of a temporary nature, but there is good and sufficient accommodation for the artillery. During the three years under report the average annual strength was 670; the average sick treated per annum was 1,399, being in the proportion of 208·8 per cent. The annual number of deaths was 14, in the ratio of 20·8 per thousand.
No. 9.—SHOLAPORE.	A company of European artillery has been stationed at Sholapore as a portion of its regular garrison during the last 10 years, but between the years 1857 and 1860 detachments of infantry were located there. These have, however, now been withdrawn. The average annual strength has been 143; the number of sick treated has been 351 per annum, being in the proportion of 245·4 per cent. The average yearly number of deaths has been three, making the mortality rate 20·9 per mille. The chief classes of disease will be seen by the accompanying table (A). Even if it were desirable to locate a larger body of European troops at Sholapore than at present, there would not be sufficient accommodation, although the facility of easy access by rail makes it otherwise a convenient position.

References to Subjects and Queries.	Replies.
No. 10.—Ahmednuggur.	This, although a favourite station, and for many years the head quarters of the Bombay artillery, has been far from a healthy location for troops, as must be evident from it being placed *tenth* on the present list. The average annual strength has been 440, whilst the admissions and treated in hospital have amounted to 1,046 per annum, in the proportion of 237·7 per cent. The number of deaths has averaged 12 per annum, making the death rate 27·2 per mille. At Ahmednuggur, the increased hospital statistics is due chiefly to the arrival of recruits from England and to their being located there during the period of acclimatization. The barracks, hospital, and accommodation are all of a comparatively old date.
No. 11.—Kurrachee.	During the last 10 years the average annual number of troops at Kurrachee has been 1,566, consisting generally of one troop of horse artillery, a company or more of foot artillery, and a full regiment of infantry. The number, however, has been augmented by troops proceeding to or arriving from the Upper Provinces of India, and halting at Kurrachee until their arrangements were completed. There were 2,907 patients treated annually in hospital, being in the proportion of 185·6 per cent. The annual average mortality was 43, showing a death rate of 27·4 per mille. The number of deaths from the chief classes of disease is shown in the accompanying table (A). Cholera prevailed in 1853, 1854, and last year to a very considerable extent. The new barracks at Kurrachee are superior to any other, except at Hydrabad, in Scinde.
No. 12.—Mhow.	The station has for some years previous to the mutinies been occupied by Bengal troops. It is only since 1857 that a portion of the Bombay army has garrisoned it, and hence the statistics embrace only the three last years. The troops quartered at Mhow have consisted at different times of horse and foot artillery, of cavalry, and of infantry. The annual average strength of all arms has been 983; the number treated in hospital 2,295 per annum, being in the proportion of 233·3 per cent. The average annual number of deaths was 28, giving a death rate of 28·4 per thousand. The barracks and accommodation for European troops have hitherto not sufficed, and were of a temporary nature, but new permanent barracks of a superior description are now ready.
No. 13.—Hyderabad in Sinde.	Portions of different arms of the service have occupied Hyderabad during the last 10 years, but the strength has varied greatly, from 905 in 1856 to 52 in 1857. In the former year, the whole of the 2nd European Regiment was stationed at Hyderabad, previous to the Persian Campaign. The average yearly strength has been 418, and the average yearly number of patients treated in hospital 964, being in the proportion 230·6 per cent., chiefly, as it will be observed from the accompanying table (A), from fevers; but the number of deaths was only 12 per annum, making the annual death rate about 28·7 per mille. During the decade under notice, not a single instance of admission or of death from cholera took place. The barracks for European troops at Hyderabad surpass any other upon this side of India for loftiness and airiness.
No. 14.—Neemuch.	This station has been occupied by native troops of the Bombay army for a long time, but only since 1857 have European troops formed a portion of its garrison. These have consisted of artillery, infantry, and a few squadrons of cavalry. The barracks occupied by European troops were the best that could be restored and re-constructed out of the hospitals and other buildings formerly appropriated for natives. The mean annual strength of the last three years was 658; of these, 1,836 were treated in hospital, being in the proportion of 279·0 per cent. The average annual deaths were 20, giving a death rate of 30·3 per thousand.
No. 15.—Bombay and Colaba.	The average annual strength of European troops at Colaba and in Bombay appears by the tables to be 818 per annum, but this is fallacious, as the garrison merely consists of a wing of a European regiment and a company of artillery. The additional numbers are made up by the arrival of troops, chiefly invalids, for embarkation to England, and by drafts proceeding up country. In this way invalids arrive very often only to increase the sick list, and to swell the high death rate of Bombay, which, for the decade 1850 to 1860, reached as high as 32 per thousand. This state of things will not probably again happen, as the establishment of the Khandalla depôt relieves Bombay of invalids, whilst the railroad to Poona permits invalids from that large station being kept in their own hospitals until the eve of embarkation. Still, there is no doubt but that Bombay is a very unhealthy station, both for European and native troops. Very severe epidemics of fever prevailed in 1858 and in the present year, owing to the bad structure of barracks and hospitals, insufficient drainage, and unwholesome effluvia from the neighbouring beach.
No. 16.—Nusseerabad.	Between the years 1850 and 1857 only one company of European artillery belonging to the Bombay Presidency was stationed at Nusseerabad, and even this company was withdrawn in the early part of 1857; but since that period, in addition to a troop of horse artillery, some portion of a dragoon regiment and a wing or more of infantry have occupied Nusseerabad. During the first seven years of the decade, the average annual strength was about 60, but for the whole period of 10 years the average yearly strength amounts to 449, and the treated in hospital to 969, or 215·8 per cent. The number of deaths was 17, which, in proportion to the strength, makes the death rate 37·8 per mille. The accompanying table (A) shows the chief forms of disease met with at Nusseerabad.
No. 17.—Baroda.	This station was temporarily occupied by European troops from 1857 to 1860, but it has since been given up. A battery of Royal Artillery, with a few companies of an infantry regiment, formed its garrison, the annual average strength of which was about 354. Of this number, the treated in hospital amounted to 923, being in the proportion of 260·7 per cent. The annual mean mortality was 15, being at the rate of 42·3 per mille. This large mortality was due to a peculiar form of "*sun-stroke*," which, with "*apoplexy*," carried off 21 individuals out of the total number of deaths (45). The barracks and accommodation were merely temporary.
No. 18.—Surat.	A few European troops have been quartered in the fort at Surat since the mutinies, any continue to be so located, although the sickness and mortality has been greater than at any other station in the Bombay Presidency, as the following table (A) will show. The strength of the detachment was annually 58, the number of admissions and treated in hospital 234,

Dr. P. Rooke's Report. Bombay.	References to Subjects and Queries.	Replies.
	No. 18. Surat—*cont.*	being more than 400 per cent., whilst the deaths averaged three per annum, in the proportion of 51·7 per thousand. Out of the total number of deaths, viz., nine in the (3) three years, six occurred from diseases of the stomach and bowels, diarrhœa, or dysentery. The Castle at Surat has been always considered unhealthy, and the room used as a guard room unfit to be occupied by European soldiers, whilst the drain is occasionally very offensive.
		No. 2.—A List of all existing Sanitaria in the Presidency, with an account of the advantages or disadvantages of each.
		(1.) As places of residence for preserving health.
		(2.) As places of recovery from sickness, with diseases for which they are adapted or not adapted.
		Existing Sanitaria.
		The existing sanataria are,—
		1. Mahableshwur.
		2. Poorundhur.
		3. Mount Aboo.
		4. Ghizree.
		5. Taraghur.
		6. Sulabat Khan's Tomb, near Ahmednuggur.
	I. Mahableshwur.	Mahableshwur is situated on the western slope of the table land of the Ghâts, 17° 56″ N. L., 73° 30″ E. L., and is 4,500 feet in height at its highest point. The climate is very pleasant, the annual mean temperature being 66 F., the mean range 9·7. The air is moist from the influence of the sea breeze, which reaches the hill in full force, and preserves it from the aridity so common on the hills further eastward from the coast.
		Mahableshwur is not made use of as a sanitarium for troops in the Deccan, as it is unsuitable during the monsoon from the amount of rain which falls, the average being upwards of 250 inches. Invalids would have to descend to the plains in the hottest period of the year, and at a season when cholera generally prevails, so that this hill is not calculated either as a place of recovery for the sick or as a permanent residence for persons in health.
		In the year 1829 a party of invalid soldiers was sent to this sanitarium, but the results did not warrant the experiment being repeated. Since that period it has been resorted to chiefly in the hot months of October and November, April and May, as a hill station to escape the heats of the plains. Since the introduction of the new furlough regulations few officers are sent to Malableshwur for any continued or for any serious chronic disease, as a change to England has a more beneficial and enduring effect than a resort to any hill station in the tropics.
		A full account of the medical topography and meteorology of the Mahableshwur Hills will be found in the 1st, 2nd, and 7th Nos. of the Transactions of the Medical and Physical Society of Bombay (copies of which are obtainable at the India House), and in Dr. Morehead's published reports on the Sanitaria of Western India (*see Morehead's Researches on Disease in India, new edition, page* 728).
	II. Poorundhur.	Poorundhur has for the last eight or nine years been used as a sanitarium for troops in the Deccan. During that time about 2,000 invalids have been treated on the hill, 1,500 have been cured and returned to duty, 29 only have died, and the remainder were either returned to the plains, the climate being unsuited to their complaints, or are now occupants of the sanitarium.
		Its height is about 4,200 feet above the level of the sea, its climate is cool and invigorating, it is within the influence of the sea breeze, and the fall of rain, about 70 inches, is not so heavy as to render it uninhabitable the whole year.
		Poorundhur, like all the hills arising from the plain on this side of India, is not useful in cases of organic disease, but those from debility, fever, dyspepsia, derive great benefit. There is not space at Poorundhur for a cantonment for troops in health, but it is most useful as a sanitarium.
		A full description of Poorundhur will be found in a memorandum published by Dr. Morehead, at page 747 of the 2nd edition of his Researches, and a later Bombay account in the appendix to the sixth volume of the Bombay Medical and Physical Society's Transactions.
	III. Mount Aboo.	Mount Aboo is situated in the territories of the Rao of Sarowy in Rajpootana, 50 miles N.E. from Deesa, the principal station for European troops in Guzerat. It is in 72° 50″ E. long. and 24° 37″ N. lat., and is about 4,500 feet in height. Aboo has been resorted to for the last 20 years as an agreeable retreat in the hot weather, and since 1851 European invalids have been located there. The climate is cool and favourable for Europeans, the scenery is picturesque, and the sites for building are very eligible. Troops remain on the hill the entire year, and Mount Aboo is, therefore, not only fitted as a sanitarium for invalids suffering from the debility of fever, induced on the plains of Guzerat, but from the ample space and excellent climate it is well adapted for a permanent station for European soldiers. The barracks have been placed in a disadvantageous position, which, however, is about to be changed.
		A general topographical and medical report by Assistant-Surgeon Ogilvy up to the latest date will be found in the sixth volume of the Bombay Medical and Physical Society's Transactions, page 192.
	IV. Ghizree	Ghizree is not a hill, but a coast sanitarium, and as such has been for some years occupied for the troops in Sinde. It is elevated scarcely 60 feet above the level of the sea, but the plateau rises abruptly from the shore, and enjoys in an eminent degree the full force of the sea breeze, pure and uncontaminated, from the Indian Ocean. It is in the purity of the air, the strength of the breeze, and consequently slightly lower temperature than the camp of Kurrachee, that the value of Ghizree as a sanitarium consists, and a residence there is calculated to give a healthy tone to the weakened system, whether arising from fever or from chronic visceral disease.

References to Subjects and Queries.	Replies.
IV. Ghizree—*cont.*	Ghizree is not at all fitted for a permanent encampment for a large body of troops, owing to the want of water, of which it is entirely destitute, as all required at the sanitarium is brought from the cantonment of Kurrachee. A further account of Ghizree will be found at pages 15 and 16 of the published report on the extent and nature of the sanitary establishments, in the selections from the records of the Government of India (Military Department), Calcutta, March 1861.
V. Taraghur.	Taraghur is a hill fort, about 14 miles from Nusseerabad, close to Ajmere, which has been made use of as a hill sanitarium, and with great success. The ascent is easy, but the space on the plateau is not sufficient for more than 40 or 50 invalids. The hill is 2,800 feet above the sea, and about 1,000 above the plain. Water is collected in tanks, and supplies are abundant. The statistics do not extend beyond the present year. From April 1860 to March 1861, 178 invalids have been sent to the hill for change of air; of these, only 14 were returned without having derived any benefit. No death occurred. The cases were, however, well selected, and the experiment has proved that men suffering from debility, the result of sickness and long confinement in hospital, recover rapidly at Taraghur.
VI. Salabat Khan's Tomb.	Salabat Khan's Tomb, near Ahmednuggur, has lately been resorted to as a sanitarium for weakly and delicate soldiers from Ahmednuggur during the hot months of April and May. It is a small hill about six miles from Ahmednuggur, about 2,000 feet above the level of the sea, and 600 or 700 feet above the level of the camp of Ahmednuggur. The temperature is about two or three degrees cooler than Ahmednuggur. It is freely exposed to the high winds which prevail during the hot months in the Deccan, but on the hill these are cool, whilst in cantonment a furious hot wind may be blowing. The tomb has received certain additions and improvements since it was first occupied in 1859, and the buildings are now well adapted for the reception of invalid Europeans. About 50 or 60 men have been sent there during the hot season, with advantage and improvement to their general health. The site, from its elevation, is cool and healthy, and recent experience proves that a temporary residence is very beneficial to soldiers in a debilitated condition. There is ample space for the erection of other buildings, but the access is not good and water is not obtainable on the hill, but from a distance.

No. 3.—A List of all Places within the Presidency where Hill Stations might be advantageously fixed for the Health of the Troops, or where Sanitaria might be established, with particulars as to the elevation, topography, climate, means of access, distance from stations, &c.

There are many hills met with in the Ghauts and spurs leading from them well calculated for sanitaria, and where hill stations might be advantageously fixed, if they were accessible. These hills are generally about 4,000 feet above the level of the sea, and enjoy the same climate as Mahableshwur, but are for the most part inaccessible, deficient of supplies, and out of the line of the railroad. In the Satpoora range in Kandeish there are also hills varying from 4,000 to 6,000 feet in height, and one of these would probably be found very useful to the troops serving in Malwa, who have as yet no nearer resort for invalids than Poorundhur, which entails a long and wearisome march of 350 miles.

The general height of the most elevated hills in this Presidency seldom exceeds 4,000 feet. In one instance alone in Kandeish is there a mountain of 6,000 feet, but the plain surrounding it is said to be very unhealthy.

Between Sattara and Mahableshwur the hill of Euteshwur possesses great advantages, and is likely to prove a good locality for preserving the health of the troops. Its height is 3,600 feet, with good water, soil, and plenty of space, as well as easy of ascent.

As places of residence for preserving the health of European troops, there is no want in the Bombay Presidency.

One of these, Paunchgunny, 12 miles to the eastward of Mahableshwur, is sheltered from the monsoon. The fall of rain is so slight as to be of no inconvenience, the average being about 50 inches per annum. Troops might reside at Paunchgunny the whole year. The soil is laterite, and water does not remain on the surface. The sea breeze, although late in arrival, blows regularly for many hours in the day. There is ample space for drill, and the climate is favourable for horticultural pursuits. Its mean maximum temperature is 77°, and mean minimum 62°, whilst the extremes are from 56° to 86°. It is perfectly accessible.

An account of Paunchgunny will be found in Dr. Morehead's Note on Deccan Hill Climates, before referred to.

The sanitaria in this Presidency are generally free from malarious fever; neither does the climate produce abdominal complaints, as noticed at the hill stations of Bengal.

There are two coast sanitaria for such diseases as hill climates do not suit, one at Colaba, the other at Rairee, on the southern Mahratta coast, near Belgaum.

Colaba, although a convenient locality, is unhealthy, and it is to be hoped that some more pure and salutiferous site will be erelong selected on the coast of the Concan.

Rairee is only now being tried, and as yet the results are not known.

No. 4.—State in what Months Troops usually arrive in the Presidency from England, whether any restriction for preserving their health is placed upon the men on arriving, whether there is any place of resort provided for the men, or whether they are allowed to go at large; whether there is much drunkenness among the men after landing, and whether much preventible disease arises from such irregularities; how long the troops remain at the port after disembarkation and before proceeding to the interior; what precautionary measures are in use for protecting their health during the voyage or journey.

1. Troops have of late years arrived at Bombay in the cold season, *i.e.*, from November to March or April, but instances have occurred of earlier and later arrivals, although not common. Formerly they remained in Bombay after arrival, often many weeks, until the season permitted of their marching to their destination, and they became infected with the licence and debauchery so natural to soldiers after a long voyage, and so easily indulged in at the Presidency, but now, immediately upon the ship anchoring, the troops, if recruits,

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are inspected by a committee of two military and one medical officer, and every man undergoes examination as to his fitness to proceed or to remain.

2. Those who are too sick are again seen by the Deputy Inspector-General of Hospitals, and immediate arrangements are made to land and place them in hospital.
3. The disembarkation of the remaining troops devolves upon the Deputy Quarter-Master General, and is made within a few hours after the ship has anchored, not earlier than 3 p.m., nor later than 9 a.m.
4. The troops as they arrive from the ship by boat loads are formed on the bunder, under the officers who accompanied them from England, and are marched the distance of about half a mile to the railway terminus, *en route* to Khandalla, distant 70 miles. They are conveyed by rail to the foot of the Ghauts, and they make the ascent of the Ghauts either on foot or in country carts, the baggage in the meantime having overtaken them. At Khandalla, they are received into the new barracks prepared for them, called the "General Depôt." Here they remain along with their own and the officers of the depôt until arrangements are made to draft them to their different regiments.
5. Every precaution is taken to restrain the men from irregularities on the line of march, if it can be so called when performed by rail, and afterwards on arrival and whilst at Khandalla, which is a cool healthy locality on the top of the Ghauts and in the direct road to Poona, where the men are under discipline and without much facility of obtaining spirits.
6. If the troops are destined for Poona, they do not halt at Khandalla, but proceed on by rail to their destination. If for the stations in Malwa, they remain at Khandalla for a few days, and then proceed by bullock train in parties of 20 or more, each accompanied by a due proportion of officers, military and medical. Again, troops destined for the North and South Divisions remain at Khandalla, it may be for a few days only, or for a week or more, until steamers are ready to take them to their port of disembarkation. The steamers, often of the Indian Navy, are well found, and the numbers embarked are not large. They have then only a few marches to make on land, either to Belgaum or to Deesa, and, in the latter instance, the Bombay, Baroda, and Central India Railway takes them half the distance.
7. I do not think that anything could be better arranged than at present regarding the disembarkation of troops at Bombay, their temporary sojourn at Khandalla, and their future destination. The opening of the several railways, the establishment of a bullock train to Mhow, and the employment of steamers, have quite changed the character of "*moving troops*," and have rendered easy of accomplishment, free from danger or exposure to sickness or irregularities, what was before often attended with great trouble, risk, uncertainty, and loss of life.

No. 5.—State the general result of EXPERIENCE as regards the QUEEN'S TROOPS and EUROPEAN TROOPS of the INDIAN ARMY on the following POINTS:—

(1.) As to the best age for a soldier landing in India.
(2.) As to the amount of previous service desirable before arriving in India.
(3.) How he ought to be disposed of on landing, and what would be the best mode of life during his first years of service.
(4.) The routine of stations, the length of time he should serve on hills and plains and the total length of his service in India.
(5.) The marriage of soldiers, the present regulations in regard to this, with any suggestions for improving such regulations.

1. Experience has, I think, sufficiently proved that lads under 20 years of age are not fit for any arduous duty in India as soldiers; even the severe exertion of learning their drill is too much often for the unformed constitution in this country. In times of perfect peace and with light work lads of 18 would not incur much risk of their constitutions suffering from climate, but if the recruit is likely to be employed in the field, or in marching, and with much exposure, he ought not to land in India till 20 years of age. Although the mortality of lads of 18 is not large, yet they are very liable to fall sick and fill the hospital if submitted to hard work at that age.
2. I do not think there is any necessity for previous service in any intermediate climate, beyond that if a lad is enlisted at 18, it would be better to keep him in England for two years, and let him be thoroughly drilled during that period.
3. The great danger to troops upon first arrival is their propensity to indulge in vicious excesses after the irksome restraint of a long sea voyage, and it is their indulgence in all kinds of vice, intemperance, and exposure to the sun, with their heads unprotected by sufficient covering, that is the source of so much mischief to newly arrived troops, as before mentioned. Troops on arrival are now sent to Khandalla, where they are comparatively free from such exposure.
4. The routine of stations in this Presidency is very confined, and is only between the Deccan, Southern Mahratta Country, Guzerat, Sinde, Malwa, and Rajpootana. The Deccan and Southern Mahratta Country are comparatively very healthy, being elevated from 1,800 to 2,500 feet above the sea. As many European troops as possible should be massed in those favoured stations, and only such a number as the requirements of the country render absolutely necessary should be stationed in the plains of Guzerat and Malwa, and their reliefs should take place at least every three years.

Fifteen years is, in my opinion, the longest tour of Indian service that an European regiment should make.

5. I think that the marriage of soldiers should be by all means encouraged, as the greater number of diseases under which European soldiers are admitted into hospital are *enthetic* diseases, arising from illicit sexual intercourse, and the only truly moral and effectual check to this is the marriage of the soldier.
6. Lock hospitals and the licensing of bazaar females are only an encouragement of vice, and all police regulations have failed in checking venereal disease among either sex.
7. In a report, dated 1st April 1861, Dr. Arnott, C.B., Deputy Inspector-General of the Mhow Division, states, "From the accompanying return, which shows the amount and nature of "the sickness in the European hospitals at Nusseerabad and Mhow on 1st March 1861, it "appears that out of 193 sick no fewer than 103 are venereal cases."

"The loss to Government of the services of 103 men throughout the year must be enormous, but this return does not and cannot show the worst features of this unhappy state of matters. The consequences of the effects of this horrible complaint upon these men's

References to Subjects and Queries.	Replies.

constitutions, together with the confinement in hospital, will be felt for years. Whatever disease may prevail, wherever they may be, they will be its surest victims. Independent of the debility and rheumatic affections, which every medical officer knows they will for years suffer from, and after years of little duty and much sickness, they will have to seek a restoration to health in their mother country. The expense to Government of such men it is impossible to calculate, but there can be no doubt it would be a most economical measure to establish some institution that would protect these unfortunate men from much suffering, and the state from the enormous outlay bestowed so unsatisfactorily to all parties."

No. 6.—State any additional Recommendations or Suggestions which past experience has shown to be requisite for protecting the Health of the Troops after landing, during the transit to the interior, in stations, on the march, or in camp.

This subject has been so well cared for in this Presidency that it does not occur to me that any further steps are necessary to protect the troops from disease after landing.

No. 7.—A List of Hospital Equipments, according to existing Presidency Regulations, for 100 or any other convenient number of men,

(1.) For Station Hospitals.
(2.) For Field Hospitals.

With any additions or improvements in these equipments that can be suggested, and in the hospital regulations generally.

By Art. 45, p. 63, of the Medical Regulations of 1859, the following is the equipment of a fixed hospital :—

Presses for holding medicines	2
„ clothing	6
Compounding table	1
Writing table	2
Chairs	5
Medicine trays	2
Tables and forms as required.	
Teapoys	50 per cent.
Night chairs as required.	
Cooking utensils of all sorts.	
Crockery ware.	
Bedding, clothing.	
Table service.	

The list of clothing and bedding per 100 is as follows :—

Shirts	60
Bedgowns, single	20
„ double	20
„ warm	5
Banians	30
Drawers	33
„ warm	5
Caps	30
„ warm	5
Socks	10
Slippers	30
Belly bands	5
Bed cases	20
Pillow cases	60
Sheets	60
Quilts	30

By late regulations, the Barrack Department supplies presses, tables, chairs, cots, forms, teapoys, chests for clothing and for medicines, night chairs, bathing tubs, lamps, cooking utensils, close stools, crutches, diet boards, horses wooden, rat traps, screens, steps mussal, tables, camel trunks, urine tubs, punkas, tubs for fomentation; whilst the Commissariat Department furnish bedding, clothing, table service, and petty supplies.

There is no fixed scale of the number of each article per cent., but they are furnished in such proportions as are required, and with the sanction of the Deputy Inspector-General of the Division.

The following is the equipment of a field hospital, as per G. G. O. No. 500 of May 1858 :—

Bedding.

Bed cases	16 per 100 men.
Blankets, country	8 „
„ Europe	8 „
Sutterungees or carpets	8 „
Pillow cases	16 „
Quilts, lined with looie	16 „
Sheets	40 „

Clothing.

Banians, flannel	32 per 100 men.
Bands, belly	6 „
Bedgowns, lined with looie	16 „
Caps, lined with flannel	16 „
Drawers, cotton	8 „
„ flannel	8 „
Shirts	48 „
Slippers, pairs	12 „
Socks, worsted, pairs	32 „

References to Subjects and Queries.

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Cooking Utensils.

Cooking pots	2 per 100 men.
Dishes, tin	8 „
Forks	8 „
Frying pan	1 from 100 to 500 men.
Kettles, camp	1 per 100 men.
Knives	8 „
Plates, tin	8 „
Spoons	8 „
Tins, quart	8 „

Necessaries.

Bathing tub	1 from 100 to 500 men.
Baskets, rattan and pan	1 per 100 men.
Bed pans	1 „
Camel trunks, with straps 33 inches in length, 18 inches in breadth, 20 inches in depth	1 „
Crates or cajavas, to contain cooking utensils	2 „
Chairs, rattan	2 for 100 men or a regiment.
Fomentation tub iron	2 for 100 to 500 men.
Gindee	1 for 100 men and upwards.
Inkstand	1 for 100 men or a regiment.
Lantern, hand	2 „
Leather choggles for water.	
Pickaxe	1 for 100 to 500 men.
Powrah	1 „
Ruler	1 for 100 men or a regiment.
Table lamp	1 „
„ operating	1 on service for 200 men or a regiment.
Tarpaulin to cover stores	1 per 100 men.
„ to place under beds	2 „

Bombay, 10th August 1861.

B. P. Rooke, M.D.,
Principal Inspector-General, Medical Department.

Table A.

General Return of the Health Statistics of the Stations for European Troops in the Bombay Presidency.

Period.	Number of Years.	Stations.	Strength.	Fevers. Treated.	Fevers. Died.	Eruptive Fevers. Treated.	Eruptive Fevers. Died.	Diseases of the Lungs. Treated.	Diseases of the Lungs. Died.	Diseases of the Liver. Treated.	Diseases of the Liver. Died.	Diseases of the Stomach and Bowels. Treated.	Diseases of the Stomach and Bowels. Died.	Diseases of the Brain. Treated.	Diseases of the Brain. Died.	Epidemic Cholera. Treated.	Epidemic Cholera. Died.	All other Diseases. Treated.	All other Diseases. Died.	Total. Treated.	Total. Died.	Ratio per Cent. to Strength. Treated.	Ratio per 1,000 to average Strength. Died.
From 1858 to 61	3	Asseerghur	223	106	—	—	—	26	—	8	1	16	—	5	1	1	—	179	—	341	3	152·7	13·5
„ 1850 to 60	10	Kirkee	8,026	3,919	23	13	—	701	13	339	9	1,923	40	283	7	24	11	6,150	9	13,352	112	166·3	13·7
„ ditto	10	Aden	4,794	1,470	17	—	—	394	13	326	12	1,138	11	260	11	—	—	3,055	16	6,643	80	138·5	16·7
„ ditto	10	Poona	21,911	12,596	38	58	6	1,771	51	1,284	48	4,970	106	902	18	111	58	18,684	54	40,376	379	184·2	17·3
„ ditto	10	Belgaum	12,866	3,208	18	22	5	1,104	19	835	24	2,490	91	556	20	31	22	10,323	36	18,569	235	146·6	17·8
„ 1857 to 60	3	Sattara	1,106	884	1	6	1	48	1	31	—	209	4	56	2	19	11	787	—	2,000	20	180·8	18·9
„ 1850 to 60	10	Deesa	7,698	4,773	38	19	2	741	15	615	12	1,589	38	291	26	21	11	6,214	19	14,263	161	185·2	19·5
„ 1857 to 60	3	Ahmedabad	2,012	2,204	19	—	—	189	4	78	4	483	4	41	9	3	2	1,201	1	4,199	43	208·6	20·8
„ 1850 to 60	10	Sholapoor	1,437	1,963	8	4	—	101	—	80	2	313	11	32	1	21	10	994	2	3,508	34	244·1	20·9
„ ditto	10	Ahmednuggur	4,396	3,482	11	24	3	581	10	179	8	1,715	46	349	3	50	32	4,080	9	10,460	122	237·9	27·2
„ ditto	10	Kurrachee	15,665	10,367	90	5	—	1,493	56	996	44	4,266	128	818	35	53	26	11,072	55	29,070	434	185·5	27·4
„ 1857 to 60	3	Mhow	2,950	3,100	18	4	—	252	4	158	12	855	16	68	9	36	16	2,412	9	6,885	84	233·3	28·4
„ 1850 to 60	10	Hydrabad	4,181	4,706	56	—	—	256	11	274	7	1,000	26	294	19	—	—	3,112	7	9,642	126	230·6	28·7
„ 1857 to 60	3	Neemuch	1,974	3,299	21	8	1	175	3	136	11	412	12	43	5	—	—	1,435	7	5,508	60	279·0	30·3
„ 1850 to 60	10	Bombay and Colaba	8,183	4,506	24	11	3	548	25	582	37	2,562	88	348	18	76	35	5,895	32	14,528	262	177·5	32·0
„ ditto	10	Nusseerabad	4,495	3,538	51	32	2	269	10	224	15	1,054	47	204	30	15	3	4,360	11	9,696	169	215·7	37·8
„ 1857 to 60	3	Baroda	1,962	1,733	10	—	—	106	4	35	2	210	1	61	21	7	5	617	2	2,769	45	260·7	42·3
„ ditto	3	Surat	176	446	2	2	—	15	—	17	—	88	6	16	1	2	—	118	—	704	9	400·0	51·7

(The Mortality Tables for each Station, referred to in Dr. Rooke's report, which follow this General Return are the same as those given in the Bombay Statistical Returns, and are not therefore reprinted.)

CEYLON.

COLOMBO.

European Troops	Artillery - -	90
	Infantry - -	920
Native Troops -	Artillery - -	195
	Cavalry - -	22
	Infantry - -	503

References to Subjects and Queries.	Replies.
I. Topography.	1. Colombo is a luxuriantly-cultivated flat tropical country, on the south-west coast of Ceylon, with a few patches of low jungle, grassy plains, and slightly undulating ground. The littoral parts are covered with cocoa-nut, and beyond it are seen extensive plantations of cinnamon, mango, and other fruit trees. It is intersected by a river and branches of a fresh-water lake, which communicates with the ditch round the land side of the fort and with the canal within it. There are many rice fields and swampy ground in the surrounding country.
	2. The elevation of the station above the sea is from 12 to 18 feet, and it is nearly on a level with the adjacent country. It is from 7 to 13 feet above the level of the lake and canal. The nearest hills are about two miles from the fort, but their height is so inconsiderable, scarcely 80 feet, that no commensurate advantage could be expected to be derived from them for sanitary purposes, surrounded as they are by a dense native population. About seven miles south of Colombo, on the sea coast, is Mount Lavinia, a military station for rifle practice. It is about 50 feet higher. The atmosphere here is purer, from not being tainted with the effluvia of a large town or swampy ground. To this station might be added a convalescent hospital, both for officers and men, whose recovery is long and tedious in Colombo.
	3. The nearest mountain land is Kandy, which is 72 miles from Colombo; height, 1,670 feet. Pusilawa is 87 miles distant; height, 3,200 feet. Newera Ellia, 111 miles distant; height, 6,200 feet. Horton Plains, 127 miles distant, 6,900 feet in height.
	4. The Fort of Colombo, where European troops are quartered, is bounded for more than half the extent by the sea. A wet ditch filled with lake water bounds the remainder. A canal communicating with the lake near the fort runs through the fortifications to the sea front. The barracks and huts of the native troops are on a peninsula called Slave Island, on the fresh-water lake, and in their vicinity are some marshy grounds and stagnant streams and ditches. The Calany river is about four miles north of the garrison. It communicates by a canal with the fresh-water lake. The low land near the river and lake is liable to be overflowed in the rainy season. The inundation of the river lasts for some weeks, that of the lake only a few days. The rainy seasons are in the south-west monsoon, generally in April, May, and June, and at the commencement of the north-east monsoon in October and November. There is not much broken ground near the station. The ravines and water-pits are so few that they have not been observed to affect health, particularly of the troops who are quartered far from them.
	5. The barracks for European troops at the station are within the fort, and consequently have not the free ventilation from without so desirable in a tropical climate, and of late years upper stories have been added to Government and private houses in the fort, which have still more reduced the free circulation of fresh air in the barracks. The native troops are quartered in an airy situation outside the fort, on the south side of which is a race-course, used for military exercises, public promenade, and recreation, and an esplanade planted with ornamental trees on the north. In many parts of the fort the reflected heat of the new whitewashed houses increased the temperature of the air. In the staff surgeon's quarters, where 20 years ago the temperature was not observed higher than 86° Fahrenheit, it is frequently now at 90° in the hot season. The station is exposed to both land and sea breezes. Variable winds also prevail in the decadence of one monsoon and the commencement of another. Land wind is chilly, and considered here an unhealthy wind, and produces rheumatic and catarrhal complaints.
	6. The country surrounding the station is cultivated, and there are works of irrigation within about three miles. They are deemed prejudicial even at that distance, but not materially so. The cultivation of rice is not prohibited within certain limits. No indigo, flax, or hemp is cultivated near the station.
	7. The pettah, or native town, is within half a mile to the north of the fort, and is densely populated. There is also a smaller town on Slave Island, near the Ceylon rifle barracks.
	8. In the geological structure of the district, granitic, gneiss, laterite, and lithomargic earths predominate. There is a recently-formed sandstone belt on the sea shore. The soil is chiefly clay and sand, and sea sand is found inland in sites of ancient beach. There is no alluvial soil. The station had long since been occupied by natives, previous to European conquest.
	9. Water is usually found in the fort after a long drought at from 11 feet 6 in. to 28 feet, according to the level of the ground. In the rainy season it is found at from 7½ to 24 feet; outside the fort, from 12 feet 6 inches to 5 feet in the dry season, and from 9 to 3 feet in the rainy season.
	10. There are no surface springs, but the rain-fall is rapidly absorbed by the very pervious sandy soil. There is no higher adjacent ground the drainage from which passes into the subsoil of the station.

COLOMBO.
CEYLON.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	11. Drinking water is derived from wells. A large water supply is also derived from rain-fall for bathing, &c. There are no tanks, so defined, but the fresh-water lake extends inland from the fort. The lake is generally full, forming a defence to the fortress and an inland navigation. The plants it contains are the white and purple lotus in great abundance, several species of grasses, algæ and confervæ. Of animals, there are eight or ten species of fish, shrimps, frogs, and water snakes; also the otter. The lake is used for bathing by the native troops and population, and in dry weather the water is occasionally drunk by natives. The lake and canal are liable to pollution from impurities draining into them. A large part of the drainage of the fort empties into the canal, and there are latrines and drains discharging into the lake. Some of the wells in the fort appear too near cesspools, but are not used by the troops for drinking. In the dry season some malaria would proceed from the receding of the lake, leaving its banks exposed to the sun's action. A new system of drainage for the fort, contemplated by the Colonial Government, and embanking the lake, is suggested.
	12. The water supply for the present garrison is abundant. A slightly brackish and occasional ferruginous taste is sensible in some wells. The quality of the water is generally good, and the amount sufficient. Alumen, saline substances, and traces of iron and nitrogen have been detected in some wells. The ordinary means of raising and distributing the water is by pumps, buckets, earthen vessels, and barrels. A better supply seems unnecessary.
	13. Cleanliness and more frequent emptying of cesspools by the inhabitants, and the ventilation of latrines, are suggested.
	14. No new station has for years been selected in Ceylon. The rules laid down in the Queen's army hospital regulations appear to regulate the selection of stations.
II. CLIMATE.	1. The instruments available for conducting meteorological observations are, the barometer, thermometers for registering temperature in air, in sun, on grass, temperature of evaporation, maximum and minimum; anemometer; two rain gauges, one on the ground, and one 23 feet above the ground. The amount and nature of cloud is also registered at the Royal Engineer Observatory.
	2. The following table shows the observations for seven years, from 1st January 1853 to 31st December 1859 :—

—	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, Inches.	Winds.		Days of Sunshine.	Remarks as to Clouds, Dew, Wind, Storms, &c.
										Direction.	Force.		
January	29·888	78·47	9·9	83·42	73·52	81	76·1	108·9	3·73	N. & N.E.	Calm.	23	The atmosphere of Colombo is generally unclouded in the dry season, except in the early morning or at night, when light clouds appear. It is clouded in the wet season, and at the changes of monsoon, about May and November, when heavy clouds are accompanied by gales. These gales do not usually continue for more than a week, and during the remainder of the year light breezes prevail. There is generally a heavy dew perceptible in the morning.
February	29·883	78·57	8·18	82·66	74·48	82·24	77	110·9	2·28	N.E. & N.W.	Calm.	23	
March	29·863	80·9	9·6	85·7	76·1	83·74	78·9	110·8	4·159	W.	Moderate.	24	
April	29·817	81·76	8·68	86·12	77·44	84·2	79·95	105·03	9·471	S W.	Storm.	16	
May	29·818	81·255	7·09	84·8	77·71	83·37	79·8	98·3	14·309	S.W.	Monsoon.	21	
June	29·815	81·165	5·23	83·78	78·55	82·25	79	99·12	5·786	S.W.	Occasional Gale.	20	
July	29·821	80·445	4·67	82·78	78·11	81·75	78·2	97·8	3·584	S.W.	Occasional Gale.	20	
August	29·832	80·385	4·77	82·77	78	80·95	77·75	102·51	3·188	S.W.	Moderate.	21	
September	29·858	80·47	5·26	83·1	77·84	81·56	77·72	102·2	4·186	W. & S.W.	Sudden squalls, variable.	19	
October	29·862	79·47	5·82	82·38	76·56	81·15	78	103·4	10·542	W. & S.W.	Ditto.	21	
November	29·868	79·015	8·29	83·16	74·87	81	77·67	106·7	11·462	E.N.E.	Ditto.	23	
December	29·896	78·515	9·33	83·18	73·85	80·85	77	106	5·659	N. & N.E	Change of Monsoon, high wind.	22	

3. The climate of Colombo varies from great dampness, during south-west monsoon, to the opposite state of atmosphere in that of north-east. A cold and trying wind, called locally a long-shore wind, prevails. Towards the close of the year occasional fogs have been observed. The canal and irrigation are not extensive enough to influence the climate. Clouds of red dust are annoying in the vicinity of the station in the hot and dry seasons. The health both of European and native troops is materially influenced by the climate. Meat and vegetables must be immediately cooked, and cannot be so preserved. Verandahs and Venetians are required as shelter from the driving rain and great heat, and moisture is deposited on the walls and floors in the wet season. Clothing requires constant care and airing to preserve it from damp and insects. Drill duties and exercises take place in the open air only in the cool of the morning and evening; the latter being preferable on account of dew. About an hour at a time is as much as the troops can bear, not daily nor even in marching order. The most healthy months are July and August, December and January. The most unhealthy, April and May, September and October, at the decadence of one monsoon and the commencement of the other. The prevailing diseases are, fevers of the intermittent and remittent types, liver and bowel complaints.

4. Mount Lavinia, already mentioned, about 7½ miles from Colombo on the sea-shore, is about 50 feet higher than the station, easily drained, and supplied with water from wells. It is situated in the country, apart from towns, and would be desirable as a sanitarium, but is not of other military importance as a station.

5. The stations on which I have served are in Ceylon, at Colombo, Kandy, Trincomalee, Galle, Newera Ellia, and Pultam. Of these, Newera Ellia, and Galle appear comparatively salubrious; next, Kandy and Colombo, while Trincomalee and Pultam may be considered positively injurious to European constitutions.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station.	1, 2, and 3. Plans.
	4. The following tables show the barrack accommodation :—

Total regulation number of non-commissioned officers and men - 890

Barracks, and Quarters for married men within the Fort of Colombo.

—	Barrack Rooms or Huts.		Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
				Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
				Ft. In.	Ft. In.	Ft. In.						Ft. In.	Ft. In.
	No. 1. Barrack	a.	30 single men	62 0	25 0	19 0	29,450	981	51		5	5 4	6 6
		b.	45 ,,	90 0	25 0	21 0	47,250	1,050	50		8	5 4	5 0
		c.	1 married man	12 10	12 6	9 2	1,470	1,470	160		1	2 9	3 0
	No. 5. Barrack	a.	73 single men	150 0	23 3	16 0	55,800	764	47		15	4 1	5 0
		b.	9 ,,	23 3	18 9	16 0	6,975	775	48		2	4 1	5 0
		d.	6 ,,	26 0	12 6	10 6	3,412	568	54		3	4 1	5 0
		e.	1	18 9	14 0	10 2	2,668	2,668	262		1	3 9	3 0
		f.	1	18 9	14 0	10 2	2,668	2,668	262		1	3 9	3 0
		g.	1	18 9	14 0	10 2	2,668	2,668	262		1	3 9	3 0
		h.	1	14 0	9 3	10 2	1,316	1,316	129		1	3 9	3 0
		i.	1	14 0	8 0	10 2	1,138	1,138	112		1	3 9	3 0
		k.	1	14 0	7 6	10 2	1,067	1,067	105		2	3 9	3 0
	No. 6. Barrack	a.	1	24 0	18 0	17 8	7,632	7,632	432		2	5 5	4 0
		b.	1	12 0	13 0	17 8	2,756	2,756	156		6	5 4	4 0
	No. 7. Barrack	a.	90 single men	216 0	22 0	20 6	97,416	1,082	52		18	6 0	4 6
		b.	1	14 0	22 0	20 6	6,314	6,314	308		2	6 0	4 6
		c.	1	17 0	15 0	13 7	3,521	3,521	259		2	5 0	3 0
		d.	1	17 9	15 9	13 7	3,797	3,797	279		2	5 0	3 0
	No. 8. Barrack	f.	1	32 0	9 9	11 2	3,484	3,484	312		2	3 1	3 0
		g.	1	15 6	15 0	16 3	3,778	3,778	232		1	4 10	4 0
	No. 9. Barrack	a.	28 single men	63 3	21 0	13 10	18,374	656	47		4	4 7	4 0
	No. 10. Barrack	e.	62 ,,	129 0	22 0	15 0	42,570	686	45		9	5 6	4 6
		f.	10 ,,	25 6	24 0	18 0	11,016	1,101	61		3	5 6	4 6
	No. 11. Barrack	a.	70 ,,	207 6	16 6	13 6	46,220	660	48		9	4 2	4 6
		b.	72 ,,	214 0	16 3	13 6	46,946	652	48		9	4 2	3 0
		c.	1	14 0	13 0	12 3	2,229	2,229	182		1	3 1	2 6
		d.	1	19 0	13 0	12 3	3,025	3,025	247		1	4 0	2 6
		e	1	28 9	13 0	12 3	4,578	4,578	373		2	4 0	2 6
	No. 12. Barrack	a.	105 single men	221 0	25 0	21 6	118,787	1,131	52		36	6 0	4 6
		b.	1	16 0	13 0	14 4	2,981	2,981	208		2	5 0	4 0
		c.	1	16 0	13 0	14 4	2,981	2,981	208		2	5 0	4 0
		d.	1	16 0	13 0	14 4	2,981	2,981	208		2	5 0	4 0
		e.	1	16 0	13 0	14 4	2,981	2,981	208		2	5 0	4 0
		f.	1	13 0	11 6	9 6	1,420	1,420	149		1	3 7	4 0
		g.	1	25 9	13 0	9 6	3,180	3,180	334		2	3 7	4 0
	No. 13. Barrack	a.	44 single men	92 0	21 0	18 0	34,776	790	44		4	5 0	5 0
		b.	9 ,,	24 0	15 0	12 0	4,320	480	40		2	3 0	4 0
		c.	19 ,,	43 0	15 0	12 0	7,740	407	33		—	—	—
		d.	1	15 0	15 0	12 0	2,700	2,700	225		1	3 3	2 0
		e.	1	6 0	12 0	12 0	804	864	72		—	—	—
		f.	1	21 0	12 9	12 0	3,213	3,213	267		1	3 10	2 0
		g.	1	16 0	13 0	12 0	2,496	2,496	208		2	3 2	2 6
		h.	1	16 0	15 0	12 0	2,880	2,880	240		1	4 7	4 0
		i.	1	32 0	15 0	12 0	5,760	5,760	280		1	3 1	4 0
		k.	1	20 0	15 0	12 0	3,600	3,600	300		2	3 6	4 0
	No. 15. Staff Serjeant's Quarters	a.	1	12 0	12 0	10 0	1,440	1,440	144		2	—	3 0
		b.	1	10 0	12 0	10 0	1,200	1,200	120		2	—	3 0
	No. 27. Ditto	a.	1	13 6	13 6	9 0	1,640	1,640	182		2	5 0	2 10
		b.	1	11 3	13 6	9 0	1,366	1,366	151		1	5 0	2 10
		c.	1	11 3	13 6	9 0	1,366	1,366	151		1	5 0	2 10
		d.	1	15 0	13 6	9 0	1,825	1,825	202		2	5 0	2 10
	No. 32. Ditto	a.	1	15 0	16 0	15 0	3,600	3,600	240		3	5 0	3 6
		b.	1	12 0	16 0	15 0	2,880	2,880	192		1	5 0	3 6
		d.	1	15 0	16 0	15 0	3,600	3,600	240		2	5 0	3 6
		e.	1	12 0	16 0	15 0	2,880	2,880	192		1	5 0	3 6
		g.	1	15 0	16 0	15 0	3,600	3,600	240		2	5 0	3 6
		h.	1	12 0	16 0	15 0	2,880	2,880	192		2	5 0	3 6
	No. 33. Two Story Barrack	a.	88 single men	188 0	25 0	17 6	82,250	934	53		28	6 0	4 6
		b.	1	14 3	13 3	17 6	3,304	3,304	188		2	5 0	4 0
		c.	1	14 3	13 3	17 6	3,304	3,304	188		2	5 0	4 0
		d.	1	14 3	13 3	17 6	3,304	3,304	188		2	5 0	4 0
		e.	1	14 3	13 3	17 6	3,304	3,304	188		2	5 0	4 0
		f.	88 single men	188 0	25 0	22 0	113,400	1,175	53		24	6 0	4 6
		g.	1 ,,	15 6	14 0	15 0	3,255	3,255	217		2	5 0	4 0
		h.	1 ,,	15 6	14 0	15 0	3,255	3,255	217		2	5 0	4 0
		i.	1 ,,	15 6	14 0	15 0	3,255	3,255	217		2	5 0	4 0
		k.	1 ,,	15 6	14 0	15 0	3,255	3,255	217		2	5 0	4 0

From 1 foot to 1 foot 6 inches.

Quartermaster-General's Office,
Colombo, July 23, 1860.

(Signed) H. A. Ouvry,
Lieut.-Col., A.Q.M.G.

COLOMBO.
CEYLON.

References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	Total regulation number of non-commissioned officers and men - 676

—	Barrack Rooms or Huts.		Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
				Ft. In.	Ft. In.	Ft. In.						Ft. In.	Ft. In.
Barracks and Quarters for Married Men, occupied by the Gun Lascars in Slave Island.	No. 2. Single Men's Barrack - -	a. -	50	76 0	20 0	15 0	22,800	456	30		8	2 3	2 6
	No. 3. Married Quarters - - -	e e. -	1	13 0	13 0	9 4	1,577	1,577	169		Nil.	Nil.	Nil.
		d d. -	1	13 0	10 0	9 4	1,213	1,213	130		—	—	—
		c i. -	1	13 0	13 0	9 4	1,577	1,577	169		—	—	—
		e. -	1	13 0	11 0	9 4	1,334	1,334	133		—	—	—
		f. -	1	14 0	9 0	9 4	1,176	1,176	126		—	—	—
		g. -	24	53 0	14 0	9 4	6,925	288	30		—	—	—
		h. -	24	53 0	14 0	9 4	6,925	288	30		—	—	—
		j. -	24	53 0	14 0	9 4	6,925	288	30		—	—	—
	No. 3. Native Officers Quarters -	k. -	1	15 0	11 0	12 6	2,062	2,062	165		1	2 10	2 6
		l. -	1	15 0	11 0	12 6	2,062	2,062	165		1	2 10	2 6
		m. -	1	15 0	11 0	12 6	2,062	2,062	165		1	2 10	2 6
		t. -	1	14 0	6 6	9 4	849	849	91		Nil.	Nil.	Nil.
		n. -	1	14 0	6 6	9 4	849	849	91		—	—	—
		w. -	1	14 0	6 6	9 4	849	849	91		—	—	—
		x. -	1	14 0	6 6	9 4	849	849	91		—	—	—
		y. -	1	14 0	6 6	9 4	849	849	91		—	—	—
		z. -	1	14 0	6 6	9 4	849	849	91		—	—	—
		s s. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		n n. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
	No. 3. Married Quarters - - -	v v. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		w w. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		y y. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		z z. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		a a. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		b b. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		c c. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		d d. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		e e. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
		f f. -	1	12 0	12 0	16 0	2,304	2,304	144		1	4 0	2 7
	No. 4. Single Men's Barrack - -	a. -	36	76 6	12 0	16 2	31,537	876	54	1 Foot 6 Inches.	12	4 6	2 6
		b. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		c. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		d. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		e. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
	No. 5. Ditto - -	a. -	36	76 0	25 0	16 2	30,716	853	52		12	4 6	2 6
		b. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		c. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		d. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		e. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
	No. 6. Ditto - -	a. -	30	67 6	25 0	16 2	27,281	909	56		10	4 6	2 6
		b. -	1	20 0	12 0	16 2	3,880	3,880	240		2	4 6	2 6
		c. -	1	20 0	12 0	16 2	3,880	3,880	240		2	4 6	2 6
		d. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
		e. -	1	11 0	12 0	16 2	2,134	2,134	132		1	4 6	2 6
	No. 1. Ditto.	a. -	46	89 0	21 0	15 6	28,969	629	40		1	3 10	3 9
	No. 2. Ditto.	a. -	46	89 0	21 0	15 6	28,969	629	40		1	3 10	3 9
	No. 3. Ditto.	a. -	46	89 0	21 0	15 6	28,969	629	40		1	3 10	3 9
	From 1 to 15. Blocks, 12 men in each.		180	12 0	12 0	15 0	388,800	2,160	144		180	4 0	2 6
	No. 7. Native Officers' Quarters - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 8. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 9. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 10. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 11. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 12. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 13. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 14. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 15. Ditto - -	a. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
		b. -	1	20 0	11 0	15 9	3,465	3,465	220		1	4 0	2 6
	No. 2. Barrack, Galle Face.	a. -	40	38 0	18 0	15 6	10,602	265	17		5	5 0	4 6
		b. -	1	10 0	7 0	10 0	700	700	70		4	2 11	2 5
	No. 3. Barrack. Used as a Schoolroom -	a. -	46	48 0	37 0	15 0	26,640	579	38		4	2 11	2 5

N.B.—The huts for the mounted orderlies at Mount Lavinia not included.

(Signed) H. A. OUVRY,
Lieut.-Col., A.Q.M.G.

—	Guard Rooms or Huts.	Regulation No. of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
			Ft. In.	Ft. In.	Ft. In.						Ft. In.	Ft. In.
Guard-rooms, Cells, Defaulters' Rooms, and the Provost Establishment for European Troops in the Fort of Colombo.	To No. 1 Barrack — Guard-room, e.	15	30 0	16 6	17 9	8,786	585	33	From, 1 Foot to 1 Foot 6 Inches.	3	3 7 / 6 0	4 0
	To No. 1 Barrack — Cell, f.	1	9 0	6 0	14 0	756	756	54		—	—	—
	To No. 1 Barrack — Cell, g.	1	9 0	6 0	14 0	756	756	54		—	—	—
	To No. 13 Barrack — Guard-room, m.	8	17 0	11 0	11 6	2,150	268	23		1	3 2	3 9
	To No. 13 Barrack — 6 Cells, p to v.	6	17 0	14 0	11 6	2,737	456	39		—	—	—
	No. 21. Water Gate Guard, a.	16	51 0	17 0	13 4	1,156	72	54		5	5 0	3 9
	No. 22. — Governor's Guard — a.	1	12 6	22 10	14 0	3,995	3,995	285		1	5 10	3 11
	No. 22. — Governor's Guard — b.	16	41 0	22 10	17 10	16,694	1,043	58		9	5 10	3 11
	No. 23. South Gate Guard-room, a.	16	41 6	21 0	19 11	17,357	1,084	54		8	6 0	4 6
	No. 24. — Main guard, b.	24	50 0	23 0	20 6	23,575	982	47		7	6 0	4 0
	No. 24. — Defaulter's Room, c.	—	12 0	23 0	20 6	5,658	5,658	—		2	6 0	4 0
	No. 25. Main Barrier Guard, a.	4	15 0	15 0	10 6	2,362	590	56		2	5 5	3 0
	No. 26. South ditto, a.	4	17 0	9 0	11 0	1,683	420	38		4	4 0	3 0
	No. 35. Sally Port Guard, a.	8	19 6	15 0	17 8	5,167	645	36		5	6 0	4 0
	No. 8. Provost Establishment	16	6 0	14 0	11 3	945	59	5		26	1 6	2 6
By the Ceylon Rifle Regt.	No. 3. — Guard-room, a.	7	22 0	14 0	13 2	4,055	579	308		—	—	—
By the Gun Lascars	No. 3. — Defaulter's Room, b.	—	22 0	10 6	8 2	1,886	1,886	1,886		—	—	—
By the Ceylon Rifle Regt.	No. 3. — Guard-room, b.	15	27 3	23 0	15 6	7,314	1,044	626		—	—	—
By the Ceylon Rifle Regt.	No. 3. — Defaulter's Room, c.	—	11 0	23 0	15 6	3,921	3,921	253		—	—	—

Quartermaster-General's Office,
Colombo, July 23, 1860.

(Signed) H. A. Ouvry,
Lieut.-Col., A.Q.M.G.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	5. The windows of the barracks are on opposite sides, and are generally open, being provided with wooden shutters. In one later-built barrack, Venetian doors are provided in the verandahs up-stairs. There is a verandah on both sides, which is about 10 feet wide. The verandahs are never occupied as sleeping quarters; they are open, and do not require jalousies except in the case of upper-story barracks. 6. The bedsteads are chiefly of the usual kind, iron and wood. The bedding consists of coir (that is, cocoa-nut fibre), mattresses, one blanket each, sheets, and thin cotton coverlids, with coir pillows, for the European troops. The native troops use wooden bedsteads, mats, pillows, and woollen blankets, locally called "cumlies." 7. The tents used at Ceylon are of two sizes, double-poled and single. No. 1 double-poled tent is intended to accommodate 20 men; cubic contents in feet, 2,040. No. 2 single-poled tent, for 10 men; cubic contents, 1,190 feet. Sections of each of these tents are attached, by which it will be seen that the cubic contents of the inner compartment may be increased by removing the inner wall. 8. Besides the windows and doors; there are apertures for constant ventilation under the wall-plates of barracks, huts, and guard rooms, with ventilators at the floors. Tents are ventilated by small openings. Generally speaking, the ventilation is sufficient, but some cases admit of improvement. There are no means in use for cooling the air for barrack rooms. 9. The materials of which barracks are constructed are brick, cabook, or laterite, which cuts easily into blocks, and plastered and whitewashed with lime. They have wooden roofs, covered with tiles. Some of the native troops are in barracks built with wood, plastered with mud, and roofed with cadjans (plaited cocoa-nut leaves, of which a temporary barrack is formed at Mount Lavinia in lieu of tents). 10. Floors are generally of tile or bricks, and are raised from one to three feet above the ground. There is no passage of air under the floor. 11. The construction of floors might be improved by a better description of tiles—asphalte or wood. The barracks are kept in repair by the Royal Engineer Department, and repairs are executed quickly and efficiently. The Deputy Inspector General of Hospitals is responsible for the sanitary state of the cantonment, so far as the troops are concerned. The walls and ceilings are cleansed and limewashed whenever necessary. 12. Lavatories are provided for three barracks, and a sketch of two adjacent to one another is attached. The water which is raised from the well by means of a pump is conveyed to the tank in the centre of the building. Three stop-cocks are attached to the tank, by means of which the water is let into tubs when required for bathing or washing. The water is carried off by a barrel drain into the canal. 13. The cook-houses are provided with open hearths, on which meat may be roasted, fried, or boiled. Wood is used for the fires. An oven also is provided for baking meat. The water is supplied from wells near at hand, and the refuse water is thrown into an adjacent cesspool. The washing of linen is performed by washermen, locally called "dhobies," who are sufficient in number for the wants of the station. 14. The privies are provided with pits, which are emptied when necessary. The pits are provided with man-holes, immediately behind the privies, for access. A rough sketch of a urinal is shown in the sketch of the cook and wash houses. The urinals are provided with drains. In the case of that shown a pipe conducts water from the well, which tends to keep the urinal clean. The contents of the privies are carried outside the fort to the sea shore, where they are buried with a depth of earth of three or four feet above the deposit. 15. These buildings are lighted and ventilated by means of scuttles or windows. The barracks are lighted at night with oil (cocoa nut).

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References to Subjects and Queries.	REPLIES.
III. Sanitary Condition of Station—*cont.*	16. Most of the barrack drains lead into the canal. The ordinary dimensions are 1 ft. 6 in. diameter barrel drains. The drainage of No. 12 barrack is carried by a drain *under* the canal and into the wet ditch of the fort. All the large drains were constructed in the time of the Dutch. The outlets of these drains are but a few yards from some of the barracks. The drainage is generally sufficient, and no part of the barracks or hospital is damp. Some of the fluid refuse is both evaporated and sunk in the subsoil. Cess pits are provided for most of the privies and urinals. These cesspits are ordinarily about 5 feet to 2 ft. 3 in. deep, and 4 ft. to 2 ft. 6 in. square. From one of the wells a cesspit is but 11 feet distant, and the water is only used for washing. Other cesspits are 22 feet, 55 feet, 76 feet, and 82 feet distant from the wells. The cesspit nearest to the men's quarters is three feet beyond the verandah of one barrack, and sunk eight feet below its level. The cesspit nearest to the hospital is 10 feet distant. They are opened and cleansed out whenever necessary. The water in the ditch around the fort does not flow quickly enough to prevent a large amount of mud, &c., accumulating. Most of the fort drains empty themselves into the canal which runs through the fort, and is filled from the lake and ditch. 17. The rubbish and fallen leaves within the cantonment are regularly swept and removed. The method of disposing of the manure is described elsewhere. 18. Fatigue parties of gun lascars are employed constantly in keeping the scarps and ramparts free of rank vegetation, which grows very rapidly. There are no old walls or hedges. The principal hindrance to free ventilation is the mass of houses built in the fort. 19. The drainage of the pettah and bazaar is imperfect, and open drains in many parts give out noxious effluvia. The ventilation of the rooms and privies of small houses is defective. The houses near the fort are not crowded. The latrines are in some houses too near the wells. The water supply for drinking is sufficient, but not always of good quality. There are no regular sanitary regulations. The commissioners of roads employ scavengers to clean the streets, but the drains, from the want of a sufficient supply of water, cannot be kept always clean. The local Board of Health might show more activity. An officer of nuisances ought to be appointed, and a military medical officer might be added to the board to protect the interest of the troops. The native houses near the station are generally good, but dung heaps and cess-pits are seen within the compounds, and they are not emptied as often as desirable. Several of the inhabitants of the fort keep carriages for hire, and they have neither sufficient space nor care for cleanliness to prevent the accumulation of filth. No nuisance is observed from wind blowing over the native dwellings, except sometimes at Slave Island, near the Ceylon rifle barracks. This nuisance might be prevented by police regulations and opening out the streets of the bazaar. 20. Cattle and other animals are slaughtered in the pettah, about one mile from the fort. Slaughter-houses approved of by Government are under the surveillance of the police. No nuisance is experienced from their condition. The regulation in force is Ordinance No. 14 of 1859. There are licensed butchers. The cattle, before being killed, are exposed to public view for 24 hours; but when troops are marching cattle can be killed immediately on demand by the commissariat officer. The police can seize all unhealthy and diseased animals, and have them destroyed or otherwise disposed of. The offal is thrown into the sea. 21. The inquiry respecting the stabling or picketing of horses does not appear applicable to this station. 22. The governor's "mounted orderly" stables of cadjans are on the Galle Buck, a piece of open ground between the fort and the sea. A range of officers' stables (cabook walls, tiled roof, rail doors) is built in the fort, and the dung is cleared away once a week. It is at a distance from the soldier's barracks. The manure is taken to the sea, a few hundred yards from the fort. 23. The quarters for married non-commissioned officers and men are amply sufficient for the present strength of the garrison.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is generally good. Some details of drainage, &c., are improvable. A new system of drainage is contemplated by the Colonial Government of Colombo.
IV. HEALTH OF THE TROOPS.	1. The district of which Colombo is the capital, and in which the station is situated, (called the Western Province), is considered the healthiest of maritime districts in the Island. 2. The diseases most prevalent among the natives are rheumatism, fever, and bowel complaints. The spleen does not often become diseased in Colombo. Cholera and small-pox do not visit the station as frequently as in former years. Measles and chicken-pox prevail nearly every year. A mild form of scarlatina is occasionally seen. Leprosy and elephantiasis are common. Beriberi is very rarely seen. 3. The causes of so much fever, bowel complaint, and rheumatism are the hot and moist state of the atmosphere, and the presence of malaria in it. Natives are also, from their general debility and poorness of living, more susceptible than Europeans to fevers. 4. The troops at this station came from England in good health—the 50th, after a stay of 10 months; the Royal Artillery, after about 18 months. With the exception of the two companies of Europeans recently arrived from Trincomalee, the European troops have been stationed in Colombo since their arrival in the colony—the Royal Artillery since November 1858, the 50th since October 1857. The diseases from which they have chiefly suffered since their arrival are liver complaints, dysentery, and fever. There is no perceptible difference in the healthiness of the different portions of the men's accommodation. 5. The troops are not camped out except in case of epidemic, &c. 6. The medical member of the board has been in charge of troops at the hill stations of Newera Ellia, and Kandy, and Badulla, and considers that better health is enjoyed there by the troops than at Colombo.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	7. We have not had many opportunities of making observations whether the troops resident for some time on hill stations are more or less liable to disease on returning to the plains, as very few men are stationed at a time at Newera Ellia. But it would appear from the present healthy state of the 50th detachment at Trincomalee, which went there after a residence of two years in Kandy, that they are less liable to fevers than the men who had long resided at Trincomalee. This immunity from the usual frequency of disease is, in our opinion, to be attributed to acclimatization, and the less debilitating effects of the climate of Kandy; the above-mentioned detachment having been moved to Kandy immediately on its arrival in Ceylon, whereas the detachment of the 50th, recently removed from Trincomalee, was sent there direct from England. 8. We approve of selecting hill stations for troops. 9. There are no diseases peculiar to hill stations. 10. The men, while at hill stations, should be supplied with extra blankets and warmer clothing, and abundant means of recreation and out-door amusements provided for them. 11. The dry season at Newera Ellia is preferable for invalids, but to the healthy any period of the year is equally good, if they will avoid exposure to the wet. Four months is the shortest period in which men merely debilitated would obtain the full benefit of a residence on the hills, and eight months or a year would be necessary for those with organic diseases. 12. We cannot speak from experience whether there is any period of residence beyond which injury to health is likely to be inflicted, but we presume that men who have been long accustomed (more than one or two years) to breathe, at an elevation of 6,000 feet, a more rarefied and colder air, are likely to suffer from pulmonary and hepatic congestions if they are brought down suddenly into the hot plains. But as Ceylon affords places for stations at various elevations, troops need not be removed at once from the highest to the lowest post. 13. No special precautions have hitherto been used on returning to the plains, and none seem necessary except greater temperance. 14. It in some measure depends on the height of the hill whether it would be desirable for health to locate troops on hill stations, with short periods of service in the plains. At moderate elevations, such as Kandy, we think residence there, with occasional change to the plains, the preferable alternative. Frequent change of station on the plains is considered beneficial. 15. The site of the former hospital (lately burnt down) and that of the present barrack at the hill station of Newera Ellia appear objectionable, and the accommodation insufficient. At Mount Lavinia, the former invalid quarter for four officers has latterly been occupied by detachments at rifle practice, leaving none available, a deficiency greatly felt. 16. The general opinion appears to point out a range of elevation from 3,000 to 4,000 feet as the best. 17. Mount Lavinia, before mentioned, might advantageously be occupied as a hill station. 18. A sandy or gravelly surface, with a clay subsoil, appears to be less healthy than a loamy soil covered with vegetation. 19. From 20 to 25 years is the best age for soldiers proceeding to Ceylon, and July and August are the best months for landing there. On first landing, the troops go into barracks, and are clothed in white cotton, with white covers to their forage caps, wearing cloth clothing in wet weather and at night. They take the usual duties of garrison and drill, but do not march out in marching order. The precautions necessary are attention to diet and temperance, and to avoid exposure to the sun, also to send recruits to Kandy on landing in Ceylon. 20. Troops might be sent direct from home depôts to Ceylon, as Kandy would answer for an intermediate station. They should be sent to hill stations on landing, and gradually accustomed to the climate. 21. In Ceylon troops proceeding from the port to the interior march 10 or 12 miles in the early morning, and are accommodated at most of the halting places in Government rest houses, and at others in tents, which is objectionable. Permanent cover ought to be provided. 22. I consider, on the average, that six years should be the term of a soldier's service in Ceylon. 23. As regards invaliding, the principal medical officer in Ceylon decides, on the report of the medical officer in immediate charge, without the intervention of a board, except in case of officers. 24. Invalids should leave Ceylon for home in January.
Diseases.	1. There are weekly inspection parades for the discovery of disease. 2. Scurvy or scorbutic diseases are rarely seen in Ceylon. A few cases have occurred at Trincomalee. They are to be attributed to a want of vegetable food, of which a proper proportion is required, but not always procurable. 3. The proportion of cases of hepatic disease amongst European troops is as 35 per 1,000 to total admissions. For native troops, 3·8 per 1,000. This disease is caused by the climate and the immoderate use of ardent spirits. It is sometimes the sequel or concomitant of fever and dysentery. The men should be cautioned to drink spirits watered, and in the cool of the evening, and not to expose themselves to solar influence or chills. 4. The only cases of dracunculus which have come under observation are the few occurring in natives of India who come over to Ceylon. No case is on record as occurring in a native of Ceylon or in a European. 5. The proportion of venereal cases to the total sick from all other diseases is very small indeed, viz., average one in 6 admissions from all diseases. It would be advantageous to the health of the army to establish lock hospitals in Ceylon.

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References to Subjects and Queries.	REPLIES.
Diseases—*cont.*	6. The troops suffer chiefly from endemic diseases, viz., fevers of the remittent and intermittent types, of which, however, few die, since quinine is liberally administered. Dysentery is the most fatal of endemic diseases, although the mortality from it is considerably reduced since phlebotomy and mercurial ptyalism have become the exception and not the rule. Cholera seldom visits this station, and troops suffer very little from it of late years. Small-pox rarely affects the troops, even when prevailing among the native inhabitants. Rheumatism is very prevalent, but very few deaths occur from it. The proportion of admissions and deaths is given in the following table :—

	Europeans.				Natives.			
	Admissions.	Deaths.	Proportion of Admissions from these Diseases to Total Admissions per 1,000.	Proportion of Deaths from these Diseases to Total Deaths per 1,000.	Admissions.	Deaths.	Proportion of Admissions from these Diseases to Total Admissions per 1,000.	Proportion of Deaths from these Diseases to Total Deaths per 1,000.
Fevers	1,438	13	182·4	92·2	1,025	11	189·6	97·3
Hepatitis	277	9	35·1	63·8	21	1	3·8	8·7
Dysentery	398	40	50·5	283·6	126	21	21·4	186·5
Rheumatism	238	2	30·1	14·1	327	5	60·4	45·1
Cholera	20	10	2·5	70·9	46	25	8·5	221·2
Small Pox	2	—	·2	—	58	4	10·7	·5
Average total strength	562				Average strength	710		
Total admissions—					Total admissions—			
All diseases	7,881				All diseases	5,405		
Total deaths	141				Total deaths	113		
Average annual deaths per 1,000 strength	24·9				Average annual deaths per 1,000 strength	18·30		

7. The more frequent zymotic diseases are catarrh, boil, diarrhœa, dysentery, dysentery with abscess in the liver, cholera, ague, remittent fever, and rheumatism. Catarrh and rheumatism are most prevalent in the intervals between the monsoons and in the rainy season. Boils generally prevail in the hot weather. Fever, diarrhœa, and cholera occur in any continued hot weather, followed by showers of rain; dysentery generally in wet weather. A form of dysentery, with marked remittent fever, prevails usually in the hot weather succeeding a rainy season. The sanitary condition of the bazaar and native dwellings is very defective. They are very dirty, the drainage generally very imperfect, open drains, and large cess-pits. Ventilation is imperfect, from a deficiency of doors and windows—the latter seldom seen in opposite sides of the house or hut. The zymotic class of diseases generally prevails in the more crowded and unclean part of the native town and bazaars. The habits of the natives make them particularly liable to attacks of fever, diarrhœa, and cholera.
8. The prevalence of epidemic diseases is not materially influenced by the nature of the soldier's duties and occupations.
9. Quinine has not been used as a prophylactic, except in individual cases, where it has proved successful in warding off attacks of fever and dysentery.
10. We think that if the soldier could always have a cup of coffee or tea (as is the case with the 50th Regiment), on rising from his bed in the morning, and before he goes on any duty, it would have a salutary effect. Means should also be within his reach, when on guard, to have some drinks of this kind before he goes on guard at night.

V. INTEMPERANCE.

1. There is not more intemperance at Colombo than elsewhere where British troops are stationed. The native troops are rarely under the influence of alcohol, but frequently under that of opium. In European troops the number of confirmed drunkards is about 5 per cent. Of confirmed opium eaters the average is 20 per cent.
2. The regimental hospital records at this station do not enable us to state the proportions of admissions to hospitals caused directly or indirectly by intemperance. Drunkenness is always punished as an offence, more or less according to the circumstances of the case.
3. Distilled spirits are sold both at the canteen and bazaar. There are numerous shops for the sale of spirits everywhere. The quality of the liquor sold in the canteen is good; the bazaar liquor is very inferior, the probable amount drank is about three drams per man. Two drams of arrack per man is part of the ration in Ceylon; it is good, and the soldier cannot draw this till noon. The soldiers do not draw the spirit part of rations, as they would be obliged to drink it diluted. They are in the habit of taking a dram early if they can get it. Early drinking is most hurtful. Convalescents get the same ration as other men in barracks. There are no drinks sold at the canteen except spirits and beer, but in the bazaar they get toddy, badly made ginger beer, and lemonade.
4. The consumption of spirits is generally injurious to health, and is not conducive to the discipline or efficiency of troops.
5. It might be injurious to restrict or abolish the use of spirits as rations or the sale in the canteens, for the troops would have no difficulty in procuring worse liquor in the bazaars, which are not under military control in Ceylon.
6. Sickness and mortality appear to have diminished since the introduction of malt liquors.
7. Coffee, tea, lemonade, &c., are not much used at this station. We consider that a moderate proportion of spirits, such as the ration, and of malt liquor, used as well as coffee, tea, &c., would not influence health, efficiency, and discipline prejudicially.
8. With troops accustomed to the use of spirits previous to arrival at Ceylon, it does not seem desirable to suppress the issue, but otherwise beer, tea, or coffee appear preferable.

References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	9. We should think it not beneficial to prohibit the sale of spirits for the reasons already assigned. 10. We would recommend that the canteens be let to civilians under proper and stringent rules and conditions to secure good liquor being supplied. We would place no restriction on the amount of liquor a man might have, because we feel satisfied that if a soldier cannot get good liquor close to his barracks he will go a long way off for bad. 11. The canteen regulations are attached, and appear to be well obeyed.
VI. Diet.	1. The composition of the ration for European troops is beef, bread, rice, tea, coffee, sugar, and salt. The quantities are beef 1½ lb., bread 1 lb., rice ¼ pint, tea ¼ oz., coffee 1½ oz., sugar 1½ oz., salt 1 oz., salt meat once a month 1 lb. The quartermaster of the regiment and an orderly officer inspect the rations daily. 2. The ration does not include any fruit or vegetable; the stoppage is 3½*d.* per day, but the men pay extra for sweet potatoes, yams, and onions. The soldier has three meals a day, breakfast at ½ past 7, dinner at 1, tea at 5 or 6 P.M. For breakfast he has bread, tea, or coffee, and a little meat or eggs. Dinner, beef, bread, rice, soup, curry, and vegetables when procurable. For tea, tea and bread. 3. We would strongly recommend potatoes and Bombay onions occasionally as an improvement in the ration. A sentry is placed at the cookhouse of each company to prevent the rations being taken away except for the use of the soldiers. 4. The means of cooking is in iron pots, frying pans, and kettles and earthen chatties. Wood is always used for firing. The kitchens are not kept very clean; it is most difficult to make natives cook with cleanliness. No soldiers cook in the kitchens, which are open sheds; the water is close at hand and plentiful. The meat is boiled, stewed, or fried. The cooking is at all times inferior; tea and coffee are made well enough. The men have coffee every morning before a march. 5. Gardens could not be established near the station with advantage.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of a cloth tunic, chako, serge trousers, leather or mohair stock, woollen or cotton socks, cotton shirts, cotton jacket and trousers, forage cap and white cover, red shell jacket, and the usual accoutrements of an infantry soldier. The native troops do not wear covers to their caps. The dress is not quite suitable for the climate, and might be improved upon. The soldier should be clothed as loosely as possible, and we would suggest the adoption of the Indian drab clothing for troops in Ceylon. The chako might be done away with, and stock should be totally discontinued. It is never required, either by day or night, at any time of the year, and is most oppressive and uncomfortable to every one who wears it. This climate does not suit patent leather. A felt helmet would be desirable as a protection from the sun. Each soldier ought to have three fine flannel shirts in possession. Soldiers are careless about their health, and cotton shirts do not sufficiently protect them from the draughts of air and the chills they are subject to. The men mount guard in white clothing, and from tattoo till relief of guards in the morning they wear shell jackets and serge trousers and great coats. They wear this last dress also by day in very wet weather. The sentries are protected by verandahs, sentry boxes, and sheds, but the protection in general is indifferent, especially from the sun.
Duties.	1. It would certainly be advisable to send out well-drilled men from home. 2. The usual routine consists of guards and pickets, and now and again fatigues for a short time. Drills are two or three times a week, sometimes from 5¾ to 6¾ A.M., or from 5½ to 6½ P.M. The men do not suffer in health from such drills; the greater number are the better for the exercise. The best hours for drills are from ¼ to 6 to 7 A.M., and from 5½ to ¼ to 7 P.M. Marches should be commenced about 4 A.M. There is a general order that no soldiers are to leave barracks without a pass from 7½ A.M. till 5 P.M. The European troops are scarcely ever exposed to the sun on duty. The men generally have four or five nights in bed during a week. 3. The guards mounted by Europeans are all in the fort of Colombo, the farthest from barracks is about ¼ of a mile. Guards are kept on for 24 hours. The native troops mount guard at the two jails about 1¾ and 2¼ miles from their barracks. There are roll calls daily at 6 A.M., 10 A.M., and at tattoo; none by night. Night duty is no doubt very fatiguing in this climate, and the weakly men cannot but suffer by it. No additional precaution can be taken to make it lighter. Men require six nights in bed
VIII Instruction and Recreation.	1. The means of recreation and instruction consist of a ball court, but which is uncovered and nearly useless, as the men are nearly always on parade at the hours it could be used; a skittle alley; the usual regimental school; a garrison library. The room is a bad one, being dark and low and badly ventilated. There are no day rooms or clubs, soldiers' gardens, workshops, theatre, or gymnasia. There is not sufficient variety of amusement for the men, but in this climate it would be difficult to provide occupation for soldiers. Men are not allowed to be out of barracks, except on duty, between 7½ a.m. and 5 p.m., which is conducive to health. 2. As improvements, we would suggest the building of a larger and cooler room for a library, and a soldier's club room, and that the rooms should be well lighted; that a gymnasium and school of arms be established, a good cricket ground formed and kept in order for the men, and that bats, balls, &c. be supplied. The fives court should be put in proper order, and covered to protect the men from sun and rain. There is a large lake at Colombo, and a couple of good strong six-oared boats would be the means of much amusement and exercise to several men. 3. The institution of soldiers' savings banks is advantageous. 4. There is scarcely sufficient shade from trees or other means to enable the men to take exercise during the day.
IX. Military Prisons.	1. The sanitary state of the garrison provost prison and of its cells is good, but the site at the north gate of the fort is confined. The cells at the Amsterdam bastion admit of better ventilation. A garrison dry room appears necessary and additional cells. European prisoners suffer from want of meat diet, which cannot be furnished for the 6*d.* per day allowed.

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References to Subjects and Queries.	Replies.
X. FIELD SERVICE.	1. There appear to be no local regulations for field medical service in Ceylon. 2. There has been little opportunity of judging of the effect of the late War Office medical regulations, but they appear amply sufficient to meet every requirement as regards the conduct of the line of march, of troops camping, billeting, &c. 3. See preceding paragraph. 4. The arrangements for field hospitals, transport of sick, &c., are agreeably to the Army Medical Regulations of 1859 and General Orders of 25th October 1815, para. 13, and 16th June 1860. (G.O. attached.)
XI. STATISTICS OF SICKNESS AND MORTALITY.	1. No forms have been received. The principal civil medical officer cannot supply the information required. Number of women and children of the 50th Regiment treated in Colombo from October 1857 to June 1860 :—

—	Number of Cases treated.	Number of Deaths.
Women - - -	38	3
Children - - -	35	11

Annual average strength -	Women - -	25
	Children - -	40
Annual average deaths -	Women - -	1
	Children - -	$3\frac{2}{3}$

There appear to be no statistical records at this station regarding the native population.

XII. HOSPITALS.

1. Plan.
2. The European hospital is 60 yards from the nearest barrack, and 24 feet from the nearest stable, which is private property. The native hospital is 50 yards from the nearest barrack, and 500 yards from the nearest stable. The houses of civilians in the fort form the opposite sides of the streets and lanes bounding the European hospital, except in the direction of the ramparts. The native military hospital stands apart on Slave Island, and the site is open and well ventilated. The site of the European hospital is perhaps one of the best in the fort, but being lower than the walls of the fort and other buildings it is not the best position. The drains are generally clean, but from the defective system of drainage in the fort, unpleasant odours are not unfrequently complained of. The banks of the lake left uncovered with water in the dry season appear objectionable in the case of the native hospital.
3. The water supply is good and wholesome.
4. The refuse water and other impurities are carried off by barrel drains. The outlet is in the canal, about 90 yards from the hospital, which being at times choked up, causes a regurgitation of effluvia in the latrines, sometimes so abundant as to diffuse itself in the verandahs and wards.
5. In the European hospital the lowest ward is about six inches above the surface of the yard, and two feet above the road outside. In the native hospital the lowest ward is about six inches above the ground. The floors are brick, and have no perflation of air beneath. The roof water at the European hospital is led by pipes into drains, of which there are none at the native hospital, as the ground slopes towards the lake. At the European hospital the gutters and drains are capacious and sufficient, but the outlet of the principal underground drain at the canal is occasionally choked with mud. The rain, however, is carried away rapidly at both hospitals. The hospital is built of brick, laterite blocks, and mortar, wooden beams and rafters, covered with ordinary tiles. The roof is single, and the walls single, but sufficiently thick. The wards of the European hospital are not all supplied with verandahs on both sides. There is, however, sufficient shelter from the sun's rays. The native hospital has verandahs on both sides. Their breadth is 8 ft. 8 in. The verandahs of the European hospital are 8 ft. 4 in. broad. The sick are not accommodated in the verandahs. The convalescents walk and lounge there, but their beds are in the wards. The hospital consists of but one flat.

EUROPEAN HOSPITAL.

Date of construction, 1770.—Total number of wards, 10.
Total regulation number of beds, 232.

Wards or Hospital Huts.	Regulation Number of Sick in each Ward or Hut.	Dimensions of Wards.							Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.		Windows.				
		Length.		Breadth.		Height.		Cubic Contents.					Number.	Height.		Width.	
		ft.	in.	ft.	in.	ft.	in.				ft.	in.		ft.	in.	ft.	in.
18 z. - -	6	12	0	32	0	22	0	8,448	1,408	64	1	8	1	4	3	4	3
18 y. - -	48	94	0	32	0	22	0	66,176	1,378	62	,,		4	8	2	5	2
													6	4	3	4	3
18 h. - -	16	29	0	23	0	22	0	14,674	917	41	,,		1	8	2	5	2
18 c. - -	14	29	0	23	0	22	0	14,674	1,048	47	,,		2	8	2	5	2
18 b. - -	16	30	0	23	0	22	0	15,180	948	43	,,		2	8	2	5	2
18 a. - -	12	23	0	23	0	22	0	11,638	969	44	,,		1	8	2	5	2
													2	4	3	4	3
18 o. - -	44	87	6	23	0	22	0	44,275	1,006	45	,,		6	8	2	5	3
													5	4	3	4	3
18 r. - -	26	51	0	19	0	21	0	20,349	782	37	,,		3	8	2	5	2
													2	4	6	3	4
18 k. - -	38	75	0	23	0	22	0	37,950	998	45	,,		6	8	2	5	2
													3	4	3	4	3
	12	23	0	23	0	22	0	11,638	969	44	,,		1	8	2	5	2
													1	4	3	4	3

NATIVE HOSPITAL.

Date of construction, about 1815 and 1859.—Total number of wards,
Total regulation number of beds, 50.

Wards.	Regulation Number of Sick in each Ward.	Dimensions of Wards.						Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.		Breadth.		Height.	Cubic Contents.				Number.	Height.	Width.
		ft.	in.	ft.	in.	ft.	in.					ft. in.	ft. in.
No. 1 l. - -	12	32	0	21	0	14	4	9,632	802	56	From 1ft. 3in.	6	3 9	4 6
No. 1 b. - -	2	14	0	21	3	13	6	4,016	2,008	149	to	1	3 9	4 6
No. 1 a. - -	36	83	6	21	3	13	6	23,956	665	49	1ft. 10in.	8	3 9	4 6

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The European hospital does not receive the full benefit of the prevailing winds, but the native hospital does. The windows open on both sides, but on one side the windows are placed from 8 to 11 feet above the floor, near the roof. This is unavoidable. Some glass windows would be an improvement to the native hospital. 6. There are many windows, and the wards are lofty, but improvements might be made in the ventilation. There are no jalousies or jhilmils. 7. No means of cooling the air admitted into the wards. 8. There are no means of warming. Ceilings and walls of wards are cleansed and white-washed frequently, whenever necessary. 9. The privies in the European hospital are so situated as to be reached under shelter, but their position might be improved. The privy of the Malay hospital is detached, and a covered way to it is desirable. The sketch attached is that of the last built privies and bath rooms. The soil is carried into the large drain of the fort, and thence into the canal. The other privies' soil passes by a drain into a cesspool in the hospital square. It is emptied when required. 10. There are baths and a lavatory sufficient for the sick in the European hospital. 11. The warm and cold baths in the European hospital are sufficient and convenient. Bathing at the native hospital is performed in tubs or in the lake. 12. The washing is performed by dhobies, or washermen, outside the hospital, and is sufficient. 13. The storage is sufficient and dry. 14. The bedsteads are of iron with canvass bottoms, coir mattresses, blankets, sheets, cotton coverlets, and cotton pillows. 15. There are two kitchens in the European hospital adjoining each other, situated at one end of the quadrangle next the store room and near one ward. The native hospital has a small kitchen in an isolated position opposite the large ward. The cooking apparatus are iron boilers, small pans, and earthen vessels, and an oven. The cooks being indifferent, the broths, puddings, &c., are not of the best quality. The new scale of diets is in use, which is sufficiently varied. The native hospital is non-dieted. 16. The diet tables, diet rolls, and all returns in use are those found in the new regulations for army hospitals. 17. For the additional labour required for the working of the new and admirable system, the present hospital staff of serjeants and orderlies is insufficient. A steward and wardmaster, dispenser, and well-trained orderlies are absolutely necessary, and have been applied for by the principal medical officer. The native coolies are not allowed to attend the sick, nor is it desirable. The present allowance of 18*s.* per mensem for a cook cannot secure the services of even a tolerable one. 18. The sanitary condition of the hospitals is very fair. Convalescence is, however, often long and tedious. No epidemic diseases have ever appeared in the wards. 19. The privies of the European hospital are too near the wards; the south-west wind blows the effluvia from one of the privies into one of the wards. The lower parts of the wards might be better ventilated by perflation. Great sanitary improvements can be effected by giving a second story to the European hospital, at least, to one ward of it (which would, however, be thus deprived of the shelter of the ramparts), so that the patients, particularly convalescents, might enjoy the sight of the sea and adjoining scenery. A broad verandah on the eastern side of the large ward would also be an improvement, and enclosing in front of it a portion of the green in the hospital square. 20. The European convalescents walk in the verandahs, and on a small green opposite the front entrance of their hospital. They see nothing but the walls of the hospital, and a few trees and grass. Seats are set apart. A pallisade or wall is required round the native hospital premises, where now the patients walk on the verandah near the high road, and has been applied for by the regimental surgeon. 21. The women and children are treated in their own rooms in barracks. The arrangements are satisfactory for the present strength of Europeans. Very few native women and children seek European medical advice from regimental surgeons. As their offspring supply the ranks of the Ceylon rifles, it is very desirable that a skilled native doctor be attached, as in India, to at least the head-quarters of the Ceylon rifle corps, so as to prevent the children from suffering from native quackery, and proving inefficient recruits hereafter. 22. There are no special hospital regulations in Ceylon, not included in the new regulations for the management of army hospitals. 23. The hospital buildings not being in charge of the purveyor to the forces, the medical officers have to report to the staff officer all repairs required, which are generally effected (if small) expeditiously. But as delays occasionally occur, under a system of obtaining the sanction of the Colonial Government to estimates, it would be desirable to give to the staff officer, or purveyor, some discretionary power in urgent cases, such as emptying privies, &c. The medical officers have ample powers as regards diets.

COLOMBO.
CEYLON.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	24. There are no convalescent wards; such an accommodation would be advantageous, particularly if it were situated at Mount Lavinia, or any place outside the walls of the fort.
XIII. Burial of the Dead.	1. The burial-ground used by the European troops is outside the fort, about 330 yards from the nearest barrack. It is not in the direct influence of the prevailing winds. The native troops are buried in graveyards attached to their respective places of worship, which are distant from the barracks. 2. The area is two acres, one rood, 16 perches. The subsoil, clay and sand. The drainage is generally good; some part of it is under water when the lake overflows. Decomposition takes place rapidly. The ground is fenced round, and is properly kept. 3. There do not appear to be any fixed rules in regard to space of burials, but four feet intervals seem the average. The depth of graves is about six feet, and they are sometimes reopened after about two years have elapsed, when decomposition has taken place, but this does not occur when tombstones are erected. There is no compulsory rule as to the time of interment, but European soldiers are usually buried in 12 or 18 hours after death, and little or no difference is observed during epidemics. Of the native troops, the Mahommedans bury within six hours, the Hindoos within 12, and the Caffrees, being Christians, within 24 hours after death. 4. The graveyard is never known to be offensive. The usual forms of a military funeral are gone through in the case of European troops, the coffin being conveyed to the burial-ground in a wheel carriage. 5. The camp followers and bazaar people are buried like other natives, far from the European burial-ground. 6. No apparent injury to health results from the present practice, but the Dutch burial-ground nearest the fort being replete with corpses, might be closed with advantage. 7. During epidemics it would be desirable to inter the bodies in quick lime, and an ornamental cemetery for Europeans at a greater distance from the fort in the cinnamon gardens would be an improvement.

(Signed) C. Wilkinson, Colonel Commanding, Royal Engineer and Commandant.
Richard Waddy, Lieut.-Col. 50th Regiment.
E. F. Kelaart, M.D., Staff Surgeon.

23rd July 1860.

KANDY.

Accommodation { Queen's Troops { Artillery - 21. Infantry - 486. } Native Troops { Artillery - 32. Infantry - 374. }

References to Subjects and Queries.	Replies.
I. Topography.	1. The general aspect of the surrounding country is represented by a chain of hills, which rise round the whole of Kandy to heights ranging from 300 to 1,500 feet. There is not very much wood in the vicinity of the town, but the sides of the hills are, as a general rule, covered with low thick jungle, or planted out in coffee, with clumps of cocoa-nut palms interspersed. A large body of water occupies part of the space lying between the base of the hills. This lake is fed by small streams running from the hills, and the height of water in it is regulated by a sluice or spill water at one end. In addition to this lake a large river (the Mahaville Gunge) runs a tortuous course, encircling the immediate vicinity of Kandy. 2. The station is elevated 1,678 feet above the sea, but, on account of the hills before mentioned, it is considerably under rather than above that of the adjacent country. Its elevation above the lake is only a few feet. There is a great deal of more elevated ground in the vicinity, which it is presumed would be more healthy, but in addition to its very uneven nature, it is thought it would not be suitable for the location of troops, on account of the distance that would intervene between them, and such important colonial buildings, as the Cutcherry, Treasury, &c., which could hardly be transferred from the present position. 3. The nearest mountain is about two miles from the station, and is about 1,500 feet above the level of Kandy. There is no table land. 4. The lake before mentioned is the nearest water; it is about half a mile from the European, and one-eighth of a mile from the Ceylon rifle barracks. There is no overflow of water. In the rear of the Ceylon rifle barracks there is a large piece of ground, formerly the bed of a lake; it was drained some years since, and does not now appear to affect the health of the troops quartered near it. 5. The station, from being surrounded with hills, cannot be said to be freely exposed to the winds, viz., the north-east and south-west monsoons. The buildings, however, are not exposed to reflected sun heat. The winds are not cold, and have a beneficial effect on health. 6. The surrounding country varies very much with regard to cultivation. A good deal of land has been cleared within the last few years, and planted in coffee, but still it is thought the uncultivated is in higher proportion than the cultivated ground. There are no works of irrigation near the station, with the exception of the native paddy or rice fields, which are within a quarter of a mile of the rifle barracks, but are not sufficiently extensive to interfere with the health of the troops. There is no prohibition to the cultivation of rice within certain limits. Indigo, flax, and hemp are not grown near the station.

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	7. The town of Kandy, which adjoins the station, contains a population of 11,500 souls. 8. The general geological structure of the district is of the primary order, the surface consisting of decomposed gneiss; limestone rock (dolomite) is found within two miles. The town of Kandy is of many years standing, but the European and rifle barracks occupy, it is thought, new ground. 9. Water is found during the dry season at a depth of 45 feet below the surface, and at 30 feet deep during the rainy season. 10. The rain-fall flows readily away. The station being encompassed with hills is liable to a certain amount of water from the hills passing into the subsoil, but not injuriously to health. 11. The European troops get their drinking water from a spring, which is first led into a reservoir, and conducted thence to filters near the barracks. The men of the Ceylon rifle regiment are supplied from a well near their parade. The water is not stored in open tanks. 12. The station is well supplied with water, except during unusually hot weather. Its colour, taste, and smell are all good. The well water contains a little muriate of lime, magnesa and carbonate of soda; the running water contains a greater proportion of the soluible carbonates. The water is filtered at the European barracks. The lake water contains a greater proportion of the carbonates, with a slight admixture of organic matter from vegetable decay. It is good for washing purposes. At the European barracks the water is raised by hand and taken where required, but it has lately been proposed that the water for washing should be laid on to the different ablution rooms, and it is very desirable that this necessary service for the comfort and convenience of the troops should be carried out early. 13. There are no other topographical points to advert to. 14. No new stations have been selected in Ceylon for many years, but it is suggested, when any are required, that a board of officers, consisting of a military, a medical, and an engineer officer, should always be assembled to report on the various advantages, drawbacks, &c., that may present themselves.
II. Climate.	1. There are no means or instruments available at the station for meteorological observations. 2. The Board transmit the only tables they have been able to obtain, which are, however, far from being perfect. The observations were made at Peradenia, four miles from Kandy, 1,650 feet above the sea.

Climate from 1851 to 1858 inclusive.

From Analysis of the Climate at Peradenia (4 miles from Kandy), 1,650 feet above the Sea.

Months.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Rain, Inches.	Remarks as to Clouds, Dew, Wind, Storms, &c.
January - -	74·06	85·0	52·5	4·04	Fine; sunny; heavy dew at night; hot days, cold nights and mornings.
February - -	75·76	87·75	55·0	1·625	Fine; sunny; dewy nights & foggy mornings; days hot.
March - -	77·42	89·5	59·5	3·669	Generally a very hot and oppressive month.
April - -	77·91	89·5	67·5	7·759	Sultry, showery, and oppressive weather.
May - -	77·7	88·	66·0	8·022	Cloudy, windy, rainy; monsoon generally changes.
June - -	76·69	86·0	71·0	7·155	A very wet and stormy month.
July - -	75·64	83·5	67·0	5·72	Do. Do.
August - -	75·81	85·5	67·0	8·55	Showery, but sometimes more moderate; variable.
September -	76·13	86·5	67·0	6·318	Pretty dry weather compared with next two months.
October - -	75·1	85·75	68·2	15·46	Wind variable; much rain.
November - -	74·79	84·0	62·0	14·73	Wind variable; storms from all parts of compass; wet; monsoon generally changes.
December - -	74·05	82·75	57·0	7·72	Sometimes wet, but generally more moderate; towards end of year like January weather.

Mean Yearly Temperature, 75·92°. Mean Yearly Rain-fall, 90·75 inches nearly.

3. The climate of the station is very healthy. From January to May it may be considered hot and dry, and from June to December moist. There is a good deal of variation of temperature between day and night, which is very perceptible in the months of February and March. Towards the close of the year thick fogs arise in the early morning, which, however, are invariably dispersed by eight o'clock. There is no tree planting, canal irrigation, or irrigation of any kind to influence the climate and the air is free from dust. For a tropical climate the troops are healthy, and no unusual precautions are required, with the exception of avoiding extremes of heat, cold, and moisture. The same may be said of diet. The drills, duties, &c., take place in the early morning and evening, and no particular precautions are deemed necessary. The month of May is generally the most unhealthy at this station, and the

KANDY. CEYLON.

References to Subjects and Queries.	Replies.
II. Climate—*cont.*	months of the monsoon the most healthy. The prevailing diseases in May are fevers, cholera, bowel complaints, ophthalmia, and occasionally small-pox among the natives. 4. We have no acquaintance with any healthier district near than that of the station. 5. One of the members of this board has served at Trincomalee (another station in Ceylon), which he considers much hotter and conducive to liver complaints.
III. SANITARY CONDITION OF STATION.	1, 2, 3. A map of the adjacent country, with plans of the station and barracks, are transmitted.

4. TABLE OF BARRACK ACCOMMODATION.

Total regulation number of non-commissioned officers and men, 913.

	Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts. Length.	Breadth.	Height. To wall plate.	Height. Additional to ridge.	Cubic Contents in Feet.	Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows. Number.	Height.	Width.
			ft.in.	ft.in.	ft. in.	ft. in.				ft. in.		ft.in.	ft.in.
European barracks.	No. 1	30	75 8	15 8	11 8	6 3	17,483	582	39	1 8	4	3 6	3 0
	Do.	30	75 8	15 8	11 8	6 3	17,483	582	39	1 8	3	3 6	3 0
	No. 2	60	136 0	17 0	12 2	6 6	35,836	597	38	1 8	8	3 6	3 0
	No. 3	30	75 8	15 8	11 8	6 3	17,483	582	39	1 8	4	3 6	3 0
	Do.	14	34 0	16 0	11 9	6 4	8,160	583	38	1 8	2	3 6	3 0
	No. 4	80	165 0	20 6	11 6	6 6	49,884	623	42	1 8	12 4	5 0 4 0	4 0 2 0
	No. 5	80	139 3	19 3	13 9	8 2	47,801	597	33	1 8	18	6 0	4 0
	No. 6, ground floor	76	151 0	19 4	13 6	—	39,406	518	38	1 7	20	5 0	4 0
	Do. first floor	78	153 0	20 6	13 9	8 0	55,664	713	40	1 8	20	5 0	4 0
	Royal Artillery barrack	20	38 6	26 3	12 9	9 8	15,794	789	50	1 7	8 4	6 0 2 0	4 0 4 0
Ceylon Rifle barracks.	Gun Lascar lines	24	133 8	28 0	8 10	8 2	37,440	1,560	120	—	None.		
	No. 1. Family barrack	42	223 0	27 0	7 0	8 6	60,390	1,437	127	—	,,		
	No. 2. Do. and single	21 married 81 single	238 0 233 0	12 2 12 2	8 0	7 3	34,480	1,449 425	127 35	— —	,,		
	No. 3. Do. do.	10 married 36 single	112 0 110 0	12 2 12 2	8 2	6 4	15,714	436	127 37	— 1 7	,, 2	3 6	4 6
	No. 4. Single men	56	134 0	18 0	11 6	7 6	36,783	646	43	1 7	16	4 0	3 0
	No. 5. Family barrack	24	134 0	27 0	8 4	6 6	—	1,449	126	—	None.		
	No. 6. Do.	18	134 0	27 0	8 4	6 6	—	1,449	126	—	,,		
	No. 7. Do.	18	100 6	27 0	8 4	6 6	—	1,449	126	—	,,		
	No. 8. Do.	24	100 3	27 0	8 4	6 6	—	1,449	126	—	,,		
	Castle Hill barrack (single men.)	36	73 6	21 6	8 6	9 3	21,540	598	43	1 7	7	2 6	2 0
Guard rooms.	European barrack	15	20 4	30 8	11 6	6 0	7,476	519	41	1 7	2 2 2	4 0 3 0 3 0	3 0 3 0 1 6
	Ceylon rifle	22	40 6	24 0	10 9	9 0	14,823	673	44	1 7	4 3	6 0 2 0	4 0 4 0
	Hospital	4	60 0	11 6	14 3		9,832	2,458	230	1 7	4	4 6	3 0
	Magazine	4	15 3	9 6	11 0	5 6	1,991	498	36	1 7	2 2	2 0 3 0	1 4 2 2
	Cutcherry	14	38 4	12 6	13 0	5 0	8,050	575	32	1 7	2	3 7	2 6
	Royal Artillery barrack	4	16 9	9 0	8 6	9 3	1,950	487	37	1 7	2	2 0	3 0
	Pavilion gate	7	17 9	17 0	12 0		3,621	517	43	1 7	3	5 0	3 0
					To coping of arch.	To top of arch.							
	Twenty prison cells in two stories.	Ground floor 1 First floor 1	12 0 13 0	6 6 6 6	10 6 10 6	12 8 12 8	1,057 976	1,057 976	84½ 76	1 7 1 7	2 2	2 0 2 0	1 6 1 6

5. The windows are on opposite sides of the barracks, hung so as to allow them to open to the full space of the window. There are verandahs, generally about eight feet wide, on both sides of the barracks, but they are never occupied as sleeping quarters by soldiers or other persons. There are no jalousies in the soldiers' barracks.

6. The majority of soldiers' cots are of wood (6 ft. 2 in. by 2 ft. 6 in.); a few are of iron; but the men prefer the former as more convenient during the day, and allowing the men to repose with greater ease. The bedding consists of a coir mattress, two blankets, four sheets, a rug, a mat, and a coir pillow. No improvement can be suggested.

7. Troops are not encamped at this station.

8. The windows, doors, and openings in the wall near the wall-plate afford the principal means of ventilation. The ventilation is sufficient in the barrack occupied by European soldiers, but more is required for the Ceylon Rifles. No means are provided for cooling the air of barrack rooms at this station.

9. The barracks are built of brick, and wattle and daub, with brick pillars; the roof is covered with flat or half round tiles. There are no tents or huts in use.

10. The floors of the European, and the last constructed barrack for the Ceylon Rifle regiment, are of bricks; the rest of the Ceylon Rifle barrack floors are beaten earth.

11. The materials used in the construction of the buildings appear suitable for the climate, and no improvement can be suggested. Barrack repairs are executed by the

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	Royal Engineer department, and within reasonable time. There is no special sanitary officer. The walls and ceilings of barracks are cleansed and whitewashed at no regular interval, but a sufficient quantity of lime is allowed to the troops for this purpose.
	12. The wash-houses for the European soldiers are faulty in construction, and too limited as to space. There are six of them at the European, one at the Royal Artillery barracks, and none at the Ceylon Rifle lines. These buildings are too narrow, and no one wash-house provides sufficient accommodation for the barrack to which it is attached. Round the inside walls runs a brick platform for holding the small hand tubs. A large cask, containing the water for washing purposes, and bathing tubs, are crowded into the internal space. Two coolies attached to the pioneer department are allowed to each company to fill the tubs with water. The floor of the wash-houses is sloped to the centre, and an underground drain conveys away the water.
	13. The cook-houses for European soldiers are made in the native fashion. A raised brick platform against one wall acts as a hearth, on which are placed the culinary utensils, consisting of pots for boiling, and frying-pans; but there are no ovens. At the Ceylon Rifle barracks there are no cook-houses. The single men mess with the married, who are obliged to cook their food in their small dwelling-rooms and verandahs. Water is brought by the native cooks. A surface drain carries off the refuse water. All washing for the troops is done by native dhobies, away from the barracks.
	14. The privy at the European barrack is built over a cess-pit, and the soil is emptied by natives, on contract, into pits dug to receive it. As the Royal Artillery barracks are built on the side of a hill, a shallow pit receives the soil, where it remains till washed away into the jungle by surface drainage which is led into it. The privy for soldiers of the Ceylon Rifle regiment is built over a running stream, which carries away the soil. Open brickwork on the level of the ground and in the gables, together with the absence of doors, afford the means of ventilation.
	15. In the barrack rooms 1½ gills of oil are allowed to every 25 men, and half an ounce of cotton thread, every month, and the same for every excess of 13 men or more. Street lamps at convenient distances give light near the barracks.
	16. A brick barrel drain, three feet in diameter, leads from the barracks into the town drainage, and surface drains lead into this from the urinal, kitchen, wash-houses, and different parts of the barracks. The distance from the barracks to the town sewer is about 120 yards. The drainage is sufficient for all purposes. No part of the barracks or hospitals is damp.
	17. The ground near the barracks is kept cleaned by fatigue parties. The police keep the streets of the town clear by means of daily prison labour, and the refuse is carted away and burnt or buried.
	18. The surface of the cantonment is kept free of vegetation, and there are no old walls, thick hedges, &c., to interfere with ventilation.
	19. There is no regimental bazaar, but the town of Kandy is under a civil sanitary board. The drainage and ventilation are good. The water supply is from the lake and wells, and the town is kept clean. There are some public latrines. Local ordinances empower the police to impose fines and other punishment upon individuals who neglect private cleanliness, and prisoners sweep the town daily. The existing arrangements are ample. The native houses or huts are good, and no dung-heaps are allowed. No nuisance is experienced in barracks from wind blowing over native houses.
	20. The slaughtering-houses are situate about 1½ miles from the barracks. A civil ordinance regulates their distance from the town, and provides for cleanliness, &c. The offal, &c., is carried off by a running stream.
	21, 22. There are no bazaar horses, stables, or picketing grounds at the station.
	23. For married non-commissioned officers there is sufficient accommodation. None is provided for the married private soldier, which is owing to the barracks being at present unoccupied. Sufficient separate rooms are found for them.
Officers' Quarters.	1. The sanitary condition of the officers' quarters is generally good, as far as the surrounding ground is concerned. An exception to this is No. 33 officers' quarter, which is too near the native buildings, with their objectionable adjuncts. The condition of some of the quarters is under consideration. As a rule, being in most cases detached bungalows, they are on too limited a scale. The sleeping apartments should be larger and loftier, and convenient bath-rooms should be added.
IV. Health of the Troops.	1. The station, district, and adjoining native population are all healthy.
	2. The most prevalent diseases among the natives are fevers, bowel complaints, cholera, and small-pox occasionally, but the latter has been checked by the introduction of vaccination. There is no spleen disease.
	3. The healthiness of the natives we attribute to the comparative elevation of the district, the general cultivation of the country, the good drainage and cleanliness of the town, and the fact that the people are as a rule in very easy circumstances.
	4. The 50th regiment arrived in Ceylon in October 1857 from England, having previously served in the Crimea and India. The detachment of the regiment at present quartered in Kandy arrived from head-quarters, Colombo, in December 1859, the greater part of the men having been there since their debarkation. On arrival at this station they were in good health, and have not suffered since from tropical diseases. The three barracks at present unoccupied would in all probability be more unhealthy than the others, on account of their relative nearness and their limited width and height; and the board are strongly of opinion that on no account should these three barracks be occupied.

KANDY. CEYLON.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	5. The troops at the station are never camped out. 6. None of the committee have ever been in charge of troops at hill stations. 7. The troops from Newera Ellia, the only hill station in Ceylon, do not appear to be more liable to attacks of febrile and other diseases on coming down. The Kandian provinces are not unusually malarious. 8 to 16. No experience of hill stations. 17. There is no higher ground near the station which could be advantageously occupied as a hill station. 18. In this island the soil and subsoil (decomposed gneiss and granite) are sufficiently permeable to allow moisture to pass rapidly away, and therefore they are well adapted for human occupation. 19. Soldiers should proceed to India at the age of 20 years, and should land there during the months of October and November in all parts except the Madras coast, where the troops should land in September or January. On first landing in Ceylon barracks are available for the troops. The men continue to wear their sea kit until equipped with the light clothing of the country. Drills take place in the morning and evening, and the men take their usual tour of duty. When the 50th regiment landed, two companies marched to Kandy, one to Galle, and two proceeded by water to Trincomalee. All recruits should be provided with flannel shirts and light Indian clothing (khakee uniform and basket helmet). They should not be allowed to expose themselves to the sun, and have a moderate amount of drill and duty, and have sufficient and proper bedding for the specific climate to be found as at present provided. 20. Troops should be sent direct from the home depôts to India, and it is thought it would be better if the men of a regiment were kept together for the first year or so in order to get them accustomed to the ways of the country, new mode of life, &c., suitable spacious barracks with day-rooms, &c., being provided. 21. In Ceylon the troops march always in early morning to the interior. Tents are sent on and pitched at the several halting places. The men's packs are carried in bullock bandies. A steamer conveys the troops when sent by water. No additional precaution is required, as every comfort is provided for the soldier. 22. A British soldier should on no account serve in India longer than 10 years. (P.M.O. is of opinion this term might be extended to 15 years, in certain parts of India.) 23. No difficulty has been experienced at this station in reference to invaliding by medical boards. 24. Invalids departing for home should leave India so as to arrive in England in the summer.
Diseases.	1. There is a weekly inspection parade held for the discovery of incipient diseases among the troops. 2. There is no scorbutus or scorbutic disease among the troops at the station. 3. The cases of hepatic diseases under treatment were in 1855–6, one; 1856–7, five. In 1857–8 the returns were incomplete, but in 1858–9 two cases occurred, and for the remainder of 1859 the returns show a total of seven afflicted with this disease. Its occurrence is attributed to the tropical climate; it is often combined with dysentery. We have no special prophylactic measure to propose. 4. Dracunculus is not known here. 5. The proportion of cases of venereal diseases is 13 per cent. per annum. The only precaution in reference to them appears to be the sanctioned increase of marriage among soldiers. The establishment of lock hospitals is not considered desirable. 6. Fever occurs to a limited extent among the troops, in the intermittent, remittent, and continued types. Dysentery also occurs, but to a still less extent. Cholera occasionally appears, but there has been no case of small pox for years. A limited number of cases of rheumatism also occurs. The following Table shows the proportion of admissions to total admissions from the above diseases, and the proportions of deaths to total deaths :—

Total Admissions in 4 Years from all Diseases.	Admissions from	Proportion of Admissions.	Proportion of Deaths.
736	Fevers, 174 - -	23 per Cent.	1 in 736.
	Dysentery, 27 - -	3½ Do.	Do.
	Cholera, 5 - - -	6 per Mille.	Do.
	Small-pox - - -	—	—
	Rheumatism, 42 - -	5½ per Cent.	—

7. The zymotic diseases most prevalent are fevers, rheumatism, dysentery, venereal diseases, ophthalmia, and cholera; the first four appearing in the hot season, and the rest being diffused over the year. Cholera has appeared under various and uncertain climatic conditions, often in the month of May, after the first showers of the monsoon. The town of Kandy is not unhealthy, and epidemics have almost disappeared since an efficient system of drainage has been in force. No peculiar habits or conditions have been remarked among the troops or native population as predisposing to these diseases, but cholera and small-pox follow in the train of the immigrant coolies, and generally affect those who are badly fed and housed.
8. Epidemic disease at this station is not influenced by the nature of the soldiers' duties and occupations in the barrack or habits on the march or in the field.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —Diseases—*cont.*	9. Quinine has not been tried as a prophylactic against malarial disease, the measure being hardly deemed necessary. 10. Epidemic disease is not rife enough at this station to call for any special precaution for its mitigation.
V. Intemperance.	1. The body of the men at this station are temperate, from 18 to 20 men only in the two companies stationed here being confirmed drunkards. 2. During the six months ending the 30th June 1860 there were 131 admissions into the European hospital; of these 105 occurred among 114 temperate men and 26 among 19 intemperate men. Among the latter eight admissions are traceable directly, and 18 indirectly to intemperance.

Return showing the Admissions and Diseases of 19 Men of the Detachment, 50th Regiment at Kandy, reported intemperate, from 1st January 1860 to 30th June 1860.

Class.	Order.	Diseases.	Admitted.	Remarks.
I.	1	Tonsillitis	1	This table can only be given for a period of 6 months, as the last detachment carried away their records with them.
,,	,,	Febris Intermittens	1	
,,	,,	Do. Remittens	1	
,,	,,	Do. Continua	4	
,,	,,	Ophthalmia	1	
,,	,,	Diarrhœa	3	
,,	,,	Rheumatism	2	
,,	2	Syphilis Primitiva	1	
III.	,,	Bronchitis	2	
,,	,,	Obstipatio	1	
,,	,,	Phlegmon	1	
,,	,,	Caries (Dentis)	1	
V.	,,	Subluxatio	1	
,,	,,	Contusio	5	
,,	,,	Palpitatio	1	
		Total	26	

	Number of Admissions in 6 Months.
Abstinent men, none	None.
Temperate men, 114	105
Intemperate men, 19	26

3. Arrack is sold at the canteen and in the town. The quality of that sold at the canteen is good, but that vended in the town is much adulterated. Some confirmed drunkards will drink 10 gills a day, obtained from various sources; the temperate men drink from 1 to 2 gills. Spirit is not given as a ration either in quarters or on the line of march, but the troops are allowed to draw one gill daily from the commissariat for 1*d.*, but this must be watered, and the men do not avail themselves of it. No spirits are issued at the canteen except between 5½ and 8 p.m. The men do not take a dram before morning parade. Spirit is never given as a ration to convalescents. No deleterious drinks other than intoxicating drinks are sold at the canteen.
4. Spirits are not injurious to health in moderation, nor do they then affect the efficiency of a corps or its internal discipline.
5. Spirituous liquors are not part of the ration at the station. It would be injudicious to abolish their sale at the canteen, the article sold there being genuine, but that sold in the town bazaar is much adulterated.
6. The influence on health of malt liquors and wine is more beneficial than the use of spirits.
7. Tea and coffee are very little used, except at meal time, when the former is used. Lemonade, &c. are not drunk by the men. The effect on health of these drinks, as compared with spirits and malt liquor, cannot be stated for the want of data.
8, 9. It would not be beneficial to prohibit the sale of spirituous liquors, as the men would procure adulterated liquor in the bazaar.
10. The men at this station are, as a body, anxious to drink malt liquor, and would prefer it to arrack, but the price at present prevents their making very much use of it, and it would be of advantage if the Government could reduce the cost by importing beer on their own account. The canteen itself is badly situated, being too far from the barracks, and destitute of internal comforts.
11. The canteen is opened from 12 o'clock a.m. to half-past 1 p.m., with the exception of Sundays, when it is opened from 1 to 2 o'clock p.m. for the sale of beer, and from half-past 5 p.m. to 8 p.m. for beer and spirits. Serjeants or married men can take from the canteen one bottle of wine or two quarts of beer daily, and companies' messes, on the requisition of the orderly non-commissioned officer, at the rate of one pint of beer to any soldier at dinner time on payment.

VI. Diet.

1. The ration supplied daily to British troops by Government is 1½ lbs. fresh or 1 lb. salt meat, 1 lb. bread, 4 oz. rice, 1½ oz. sugar, 1½ oz. coffee, or ¼ oz. tea, and 1 oz. salt. The soldiers themselves buy 1 oz. sugar, 8 oz. bread, and vegetables. Salt meat is issued two days in the month, and the men have coffee one half, and tea the other half of the month. The rations are inspected by the officer on duty, assisted by a board if necessary.
2. The ration is supplied at the rate of 3½*d.*, in addition to which the soldier spends 2*d.*, and provides his own vegetables, of which about one-half is the proportion in the ration. The soldier takes three meals, breakfast at 8 a.m., dinner at 1 p.m., and tea at 5 p.m. He has also a cup of coffee at half-past 5 a.m.

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References to Subjects and Queries.	Replies.
VI. Diet—*cont.*	3. No practicable improvement in the ration can be suggested. A soldier looks after the ration while it is being cooked, and an officer visits the dinners to see if they are good and complete. No instance is known of the troops disposing of their ration improperly. 4. The means of cooking are by chatties, iron pots, and frying pans; there are no ovens. The kitchens are clean, light, well ventilated, and sufficiently supplied with water. The food is boiled, fried, and curried, and the cooking is properly done and sufficiently varied. Ovens with an additional supply of fuel would be advantageous. Tea and coffee are properly prepared, and the men have coffee provided for them previous to a march. 5. Garden patches are allowed to such men as wish for them, and are cultivated by more than half the men quartered here, who find their own seeds, tools, &c.
VII. Dress, Accoutrements, and Duties.	1. The soldier's dress consists of a regimental shako, leather stock, coatee, shell jacket, one pair cloth or serge trousers, four white twill cotton jackets, four white twill cotton trousers, six cotton shirts, regimental cloth cap and peak, with two white cotton cap covers, two pairs of boots, four pairs of socks, and regimental great coat (about half the men wear flannel shirts under their cotton ones.) The accoutrements are a pouch belt over shoulder, with pouch for 40 rounds of ammunition, waist belt, with bayonet and pouch for 20 rounds. The present dress is suitable for the climate, and for the day and night duties. It is considered that the introduction of the basket helmet and the khakee uniform would be beneficial. The climate of Kandy being very variable, each relief is ordered to mount sentry with clothing accordingly,—either with great coat, shell jacket, or white clothing. Sentries are posted under verandahs of buildings, and sentry boxes are provided in addition.
Duties.	1. Troops should be thoroughly drilled at home before being sent to India. 2. The routine of a soldier's duties is as follows:—The men rise at half-past 5 a.m., morning parade at 6 a.m., breakfast at 8 a.m., dinner at 1 p.m., afternoon parade, tea at 5 p.m., and roll call at 8 a.m. The men do not suffer from drill. Early morning and evening are the best times for drills, parades, and marches. There are, however, local general orders to meet the requirements of the country. The men on an average have four or five nights in bed during the week. 3. The greatest distance at which guards are mounted from their private parades is three-quarters of a mile. Guards last 24 hours; sentries are relieved every two hours. There are no roll calls by night, unless there is reason to suspect some men are absent. The men do not appear to suffer from night guards, as they are clothed according to the weather. The roll is called at meal times and parades.
VIII. Instruction and Recreation.	1. The means of instruction and recreation at the station are as follows:—There is one ball court, not covered, one covered skittle ground, a detachment school held in the barrack room (no room being assigned for the purpose), under a corporal, a good schoolmaster, and garrison library, sufficiently lighted. No room is assigned for reading, and the one in which the books are kept is not large enough to allow the men to assemble there. A barrack room is lighted at night as a reading room. There is no day room or soldiers' clubs, but there are gardens, and the men have every facility afforded for cultivating them. A temporary theatre has lately been erected in an unoccupied barrack by the men, but there are no workshops or gymnasia. The present means are not sufficient to keep the men occupied during the wet season and the heat of the day. The men are not allowed to leave barracks from 8 a.m. till 4 p.m., and this restriction is beneficial to health. 2. The improvements suggested are, that a proper reading room should be told off, and a supply of books of a lighter description than those now on hand be furnished. A gymnasium also would be of service. 3. The institution of no other savings' bank besides the Government one is thought desirable. 4. There is sufficient shade for all purposes, the barracks being supplied with verandahs, but there are no sheds, except the skittle alley.
IX. Military Prisons.	1. The military prison has lately been erected. It is surrounded on three sides by a brick wall, and as this tends to impede a free circulation of air, it would be advisable to substitute an iron railing on a dwarf wall.
X. Field Service.	The queries under this head do not apply to the station.
XI. Statistics of Sickness and Mortality.	Return showing the Admissions and Deaths in the European Military Hospital at Kandy from 1st January 1855 to 30th June 1860 (inclusive).

Class.	Order.	Diseases.	From 1st Jan. to 31st March 1855. Average Strength, 207.		From 1st April 1855, to 31st March 1856. Average Strength, 203.		From 1st April 1856, to 31st March 1857. Average Strength, 178.		From 1st April 1857, to 31st March 1858. Average Strength, 147.		From 1st April 1858, to 31st March 1859. Average Strength, 143.		From 1st April 1859, to 31st Dec. 1859. Average Strength, 134.		From 1st Jan. to 30th June 1860. Average Strength, 133.		Total.		Remarks.
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
I.	1.	Tonsillitis	2	–	1	–	2	–	–	–	–	–	4	–	7	–	14	–	
„	„	Febris Intermitt.	–	–	31	–	–	–	6	–	8	–	17	–	3	–	67	–	
„	„	„ Remittens	1	–	18	–	38	1	4	–	1	–	2	–	1	–	65	1	
„	„	„ Continua	2	–	5	–	21	–	14	–	20	–	11	–	8	–	81	–	
„	„	Ophthalmia	–	–	–	–	4	–	4	–	5	–	6	–	11	–	30	–	
„	„	Dysenteria	6	–	10	–	4	–	3	–	3	1	10	–	3	–	39	1	
„	„	Diarrhœa	1	–	4	–	11	–	18	–	4	–	23	–	15	–	121	–	

Class.	Order.	Diseases.	From 1st Jan. to 31st March 1855. Average Strength, 207. Admitted.	Died.	From 1st April 1855, to 31st March 1856. Average Strength, 203. Admitted.	Died.	From 1st April 1856, to 31st March 1857. Average Strength, 178. Admitted.	Died.	From 1st April 1857, to 31st March 1858. Average Strength, 147. Admitted.	Died.	From 1st April 1858, to 31st March 1859. Average Strength, 143. Admitted.	Died.	From 1st April 1859, to 31st Dec. 1859. Average Strength, 134. Admitted.	Died.	From 1st Jan. to 30th June 1860. Average Strength, 133. Admitted.	Died.	Total. Admitted.	Died.	Remarks.
I.	1.	Cholera	–	–	–	–	–	–	–	–	–	–	5	1	–	–	5	1	
„	„	Rheumatismus	10	–	19	–	11	–	6	–	5	–	7	–	6	–	64	–	
„	2.	Syphilis Primit.	3	–	6	–	7	–	2	–	7	–	6	–	3	–	34	–	
„	„	„ Secondaria	1	–	4	–	1	–	–	–	2	–	4	–	10	–	22	–	
„	„	Gonorrhœa	1	–	5	–	13	–	5	–	2	–	9	–	2	–	37	–	
„	„	Bubo	3	–	8	–	1	–	5	–	8	–	4	–	1	–	30	–	
„	„	Orchitis	1	–	2	–	2	–	3	–	4	–	4	–	1	–	17	–	
„	„	Strictura Urethræ	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	
„	„	Lepra	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
„	3.	Ebriositas	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	
„	4.	Vermes	–	–	–	–	–	–	–	–	2	–	2	–	–	–	4	–	
II.	1.	Anasarca	–	–	1	–	–	–	–	–	–	–	2	–	–	–	3	–	
„	2.	Scrofula	1	–	–	–	1	–	–	–	–	–	–	–	–	–	2	–	
„	„	Phthisis Pulmon.	–	–	1	1	–	–	1	–	3	–	1	–	–	–	6	1	
„	„	Hæmoptysis	–	–	1	–	1	–	–	–	1	–	–	–	–	–	3	–	
III.	1.	Meningitis	–	–	–	–	–	–	1	–	1	–	1	–	–	–	3	–	
„	„	Paralysis	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–	
„	„	Delirium Tremens	3	–	–	–	–	–	4	–	7	–	2	–	–	–	16	–	
„	„	Epilepsia	–	–	–	–	–	–	1	–	1	–	2	–	4	–	8	–	
„	„	Neuralgia	–	–	–	–	2	–	–	–	–	–	–	–	–	–	2	–	
„	„	Otitis	–	–	–	–	–	–	1	–	3	–	–	–	1	–	5	–	
„	„	Dysecoea	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	
„	2.	Morbi. Valv. Cordi.	–	–	–	–	–	–	2	–	–	–	–	–	–	–	2	–	
„	3.	Epistaxis	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	
„	„	Bronchitis	3	–	7	–	9	–	19	–	22	–	6	–	4	–	70	–	
„	„	Pleuritis	–	–	–	–	–	–	1	1	–	–	–	–	–	–	1	1	
„	„	Pneumonia	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2	–	
„	„	Asthma	–	–	–	–	1	–	–	–	–	–	1	–	–	–	2	–	
„	4.	Obstipatio	–	–	–	–	–	–	1	–	–	–	2	–	4	–	7	–	
„	„	Hernia	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	
„	„	Dyspepsia	–	–	1	–	1	–	3	–	6	–	11	–	1	–	23	–	
„	„	Colica	5	–	5	–	8	–	2	–	6	–	9	–	–	–	35	–	
„	„	Hæmorrhois	1	–	1	–	–	–	1	–	2	–	5	–	–	–	10	–	
„	„	Hepatitis	–	–	1	–	5	–	4	–	2	–	7	–	8	–	27	–	
„	„	Icterus	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
„	5.	Diuresis	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
„	6.	Hydrocele	–	–	–	–	1	–	1	–	–	–	–	–	–	–	2	–	
„	7.	Synovitis	–	–	–	–	–	–	–	–	–	–	1	–	1	–	2	–	
„	„	Contractura	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	
„	„	Toothache	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	
„	„	Ostitis	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
„	8.	Urticaria	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	
„	„	Psoriasis	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
„	„	Phlegmon	2	–	13	–	5	–	7	–	6	–	7	–	8	–	48	–	
„	„	Paronychia	–	–	–	–	–	–	2	–	2	–	–	–	–	–	4	–	
„	„	Ulcus	5	–	–	–	4	–	14	–	12	–	8	–	1	–	44	–	
IV.	4.	Atrophia Asthenia	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	
V.	1.	Subluxatio	–	–	1	–	–	–	9	–	3	–	3	–	3	–	19	–	
„	„	Fractura	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	
„	„	Contusio	–	–	5	–	7	–	13	–	6	–	11	–	18	–	60	–	
„	„	Vulnus Incis.	1	–	3	–	1	–	8	–	5	–	1	–	1	–	20	–	
„	„	Vesicul. Pedis	–	–	–	–	–	–	–	–	1	–	–	–	1	–	2	–	
„	6.	Punitus	–	–	2	–	–	–	–	–	–	–	1	–	–	–	3	–	
„	„	Observatio	–	–	–	–	–	–	3	–	4	–	2	–	2	–	11	–	
		Total	52	–	158	1	162	1	169	1	211	1	205	1	131	–	1,088	5	

Recapitulation.

Annual Average Strength during the Period, 169. Date.	Class I. Zymotic. Admitted.	Died.	Class II. Constitutional. Admitted.	Died.	Class III. Local. Admitted.	Died.	Class IV. Developmental. Admitted.	Died.	Class V. Violent. Admitted.	Died.	Total. Admitted.	Died.	Proportion of Deaths to Number treated. Remarks.
Jan. to March 1855	31	–	1	–	19	–	–	–	1	–	52	–	
Apr. 1855 to Mar. 1856	113	–	3	1	31	–	–	–	11	–	158	1	
„ 1856 to „ 1857	115	1	2	–	37	–	–	–	8	–	162	1	
„ 1857 to „ 1858	70	–	1	–	65	1	–	–	33	–	169	1	
„ 1858 to „ 1859	117	1	4	–	71	–	–	–	19	–	211	1	
„ 1859 to Dec. 1859	115	1	3	–	68	–	1	–	18	–	205	1	
January to June 1860	72	–	–	–	33	–	–	–	26	–	131	–	
Total	633	3	14	1	324	1	1	–	116	–	1,088	5	

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RETURN showing the Admissions and Deaths of the Detachment, Royal Artillery, in Military Hospital at Kandy from 1st April 1858 to the 30th June 1860 (inclusive).

Class.	Order.	Diseases.	From 1st April 1858 to 31st March 1859. Average Strength, 7. Admitted.	Died.	From 1st April to 31st Dec. 1859. Average Strength, 7. Admitted.	Died.	From 1st January to 30th June 1860. Average Strength, 7. Admitted.	Died.	Total. Admitted.	Died.	Remarks.
I.	1.	Febris Intermittens	1	–	–	–	–	–	1	–	
„	„	Diarrhœa	1	–	1	–	–	–	2	–	
„	„	Cholera	3	3	–	–	–	–	3	3	
„	„	Rheumatismus	–	–	–	–	1	–	1	–	
III.	„	Meningitis	–	–	1	–	–	–	1	–	
„	4.	Obstipatio	–	–	2	–	–	–	2	–	
„	„	Dyspepsia	–	–	–	–	1	–	1	–	
„	„	Colica	–	–	1	–	–	–	1	–	
„	„	Hepatitis	–	–	1	–	–	–	1	–	
„	5.	Diuresis	–	–	1	–	–	–	1	–	
„	8.	Phlegmon	–	–	1	–	–	–	1	–	
„	„	Ulcus	1	–	–	–	–	–	1	–	
V.	1.	Contusio	–	–	–	–	1	–	1	–	
„	„	Vulnus. Incisum	–	–	1	–	–	–	1	–	
		Total	6	3	9	–	3	–	18	3	

RECAPITULATION.

Average Strength, 7. Date.	Zymotic. Admitted.	Died.	Constitutional. Admitted.	Died.	Local. Admitted.	Died.	Developmental. Admitted.	Died.	Violent. Admitted.	Died.	Total. Admitted.	Died.
1st April 1858 to 31st March 1859.	5	3	–	–	1	–	–	–	–	–	6	3
1st April to 31st Dec. 1859.	1	–	–	–	7	–	–	–	1	–	9	–
1st January to 30th June 1860.	1	–	–	–	1	–	–	–	1	–	3	–
Total	7	3	–	–	9	–	–	–	2	–	18	3

TABLE showing Strength, Admission, and Deaths from under-mentioned Diseases annually for 10 years, from 1850 to the end of 1859 in Detachment, Ceylon Rifles, at Kandy.

Years.	Average Strength.	Admissions to Hospital.	Total Deaths.	Zymotic Diseases.	Deaths from Zymotic Diseases.	Total Fevers of all kinds. Admitted.	Died.	Intermittent Fevers. Admitted.	Died.	Remittent Fevers. Admitted.	Died.	Cholera. Admitted.	Died.	Small Pox. Admitted.	Died.	Dysentery. Admitted.	Died.	Rheumatism. Admitted.	Died.	Venereal Disease. Admitted.	Died.	Ophthalmia. Admitted.	Died.
1850–51	423	469	4	262	3	136	1	87	1	1	–	1	–	–	–	5	1	41	–	20	–	22	–
1851–52	303 5/12	346	2	186	2	89	1	66	–	16	1	–	–	1	–	3	–	20	1	20	–	31	–
1852–53	330 5/6	330	3	185	2	72	1	48	–	19	1	–	–	–	–	1	–	29	1	18	–	18	–
1853–54	306 11/12	301	22	176	19	52	1	27	–	–	–	24	14	2	–	8	2	15	1	13	–	30	–
1854–55	305	370	7	248	5	96	–	68	–	14	–	6	3	4	–	6	–	13	–	10	–	60	–
1855–56	328 10/12	582	3	392	2	178	1	159	–	7	1	–	–	7	–	18	1	56	–	31	–	26	–
1856–57	281 10/12	405	9	266	5	98	3	92	2	1	–	–	–	–	–	18	2	14	–	16	–	40	–
1857–58	247	288	7	198	6	84	1	82	1	2	–	4	3	–	–	11	1	15	–	7	–	18	–
1858–59	283 9/12	223	2	122	–	38	–	38	–	–	–	1	–	–	–	13	–	6	–	9	–	28	–
1859 9 months.	236	141	–	75	–	43	–	20	–	23	–	–	–	–	–	7	–	2	–	7	–	9	–

J. J. THOMPSON,
Assistant-Surgeon, Ceylon Rifle Regiment.

References to Subjects and Queries.

Replies.

XI. Statistics of Sickness and Mortality—*cont.*

Civil Population.

Return of Cases of Small Pox which occurred in Kandy from 1850 to 1859 (inclusive).

Year.	In Hospital.		In Town.		Total.		Remarks.
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
1850	43	16	16	4	59	20	
1851	42	12	8	5	50	17	
1852	4	–	1	–	5	–	
1853	9	–	4	–	13	–	
1854	242	81	621	90	836	171	
1855	57	16	74	13	131	29	
1856	10	–	2	–	12	–	
1857	4	–	1	–	5	–	
1858	37	8	12	4	49	12	
1859	9	3	2	–	11	3	
Total -	457	136	741	116	1,198	252	

Return showing the Number of Cases of Cholera which occurred in the Civil Branch of the Service from 1853 to 1859.

Year.	In Hospital.		In Town.		Total.		Remarks.
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
1853	59	40	144	82	203	122	
1854	20	12	107	92	127	104	
1855	–	–	–	–	–	–	
1856	–	–	–	–	–	–	
1857	31	26	37	32	68	58	
1858	37	26	57	50	91	76	
1859	16	14	15	15	31	29	
Total -	143	118	360	271	520	389	

XII. Hospitals.

1, 2. The European hospital is about three-quarters of a mile from the European barracks, and the Ceylon rifle hospital is about one-eighth of a mile from the Ceylon rifle barracks. Both hospitals are about half a mile from the bazaar. The sites are open and freely ventilated. Trees surround the buildings, but do not interfere with ventilation, rather acting as a screen. The European hospital, although on the edge of the lake, suffers no disadvantage therefrom; that of the Ceylon Rifle Regiment is on more elevated ground, and both are well drained.

3. The water supply from wells is abundant and wholesome, and the lake offers an ample supply for washing purposes.

4. At the European hospital there is a brick barrel drain to convey refuse water away to the lake, which is a few feet distant.

5. The wards are all on the ground floor, slightly raised above the outside ground, the floors being of brick. At the Ceylon rifle hospital a raised brick platform, three feet high, on which are placed the cots, runs round two sides of the ward. The roof water from this latter building runs freely away, guttering being provided at the European hospital. The surface drains are of brick, laid with a slight slope. The guttering is of wood and tin, and these means are sufficient for carrying away the rain-fall. The European hospital is an old Kandian building, and was originally occupied as a zenana. Its walls are of solid mud. The Ceylon rifle hospital walls are of brick. The roofs and walls are sufficiently thick to keep the buildings cool, although neither are double. The Ceylon rifle hospital has a verandah all round seven feet wide. At the European hospital the roof projects about five feet, which is barely sufficient to give shelter from the sun's rays. The verandahs are never used for the accommodation of sick soldiers or others. The hospitals consist of ground floors only.

KANDY.
CEYLON.

TABLE OF HOSPITAL ACCOMMODATION.

Total number of wards - { European - - - 6 ; Ceylon Rifle Regiment - 3 }

Total regulation number of beds - { European - - - 102 ; Ceylon Rifle Regiment - 49 }

Wards, No.	Regulation Number of Sick in each Ward.	Dimensions of Wards. Length.	Breadth.	Height.	Cubic Contents in Feet.	Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows. No.	Height.	Width.
		Average dimensions.									
	No.	ft. in.	ft. in.	ft. in.						ft. in.	ft. in.
European Hospital.	1	60 0	35 6	10 0	19,757	651	65 0	1 8	4	4 6	3 0†
	2	60 0	35 6	10 0	18,631	621	63 0	1 8	4	4 6	3 0†
	3	60 0	11 6	14 3	9,832	655	46 0	1 8	4	4 6	3 0†
	4	60 0	11 6	14 3	9,832	655	46 0	1 8	4	4 6	3 0†
	5	32 6	11 6	14 3	5,325	665	46 0	1 8	2	4 6	3 0
	6	17 6	11 6	14 3	2,850	712	50 0	1 8	1	4 6	3 0
				To Wall Plate. / To Ridge.							
Ceylon Rifle Hospital.	1	58 0	22 0	11 0 / 18 0	25,520	1,020	51 0	1 8	8	3 0	3 0
	2	34 0	22 0	11 0 / 18 0	14,960	1,068	53 0	*4 8	4	3 0	3 0
	3	23 0	22 0	11 0 / 18 0	10,120	1,012	50 0	*4 8	3	3 0	3 0

* The beds are placed on a brick platform three feet high.

† Three openings into adjoining ward.

References to Subjects and Queries.	REPLIES.
XII. Hospitals—*cont.*	The hospitals are so placed as to receive the benefit of the prevailing winds, especially of the south-west monsoon, but the European hospital is not so fully exposed to the north-east. The windows are usually hung on each side of the frame, and open back to the full width of the window.
	6. The means of ventilation is by doors and windows only, there being no roof ventilation, which would be desirable if occupied by a greater number of men. The present means would be quite inadequate if the hospital was occupied according to its calculated accommodation. There are no jalousies or jhilmils, only wooden shutters.
	7, 8. There is no apparatus for cooling or warming the wards. The walls and ceilings are cleansed and limewashed at irregular intervals, averaging once in six months.
	9. At the European hospital the soil falls into the lake, where it rapidly disappears. The patients' privy is about 30 feet from the wards, and is approached by a covered passage. There are no water-closets or urinals. At the Ceylon rifle hospitals there is an ordinary cess-pit. The privies are never offensive.
	10. No room is specially provided for washing in, but there are empty wards, which are made use of. Large tubs and hand tubs are placed in them, and filled with water by hand. These arrangements are quite sufficient.
	11. Large wooden and tin baths are provided for bathing the sick, which are sufficient.
	12. All hospital linen is given to dhobies, who wash the things away from the building.
	13. The storage is sufficient and dry.
	14. The bedsteads used in hospital are of iron (6 ft. 6 in. by 3 ft. 0 in.), and the bedding consists of a coir mattress, cotton pillows, four cotton sheets, and two blankets.
	15. At the rifle hospital there is no cooking carried on, but the men's diets are brought to them from their barracks. At the European hospital the kitchen is similar to those used in barracks. Chatties and pots are used for boiling, and there is a brick oven. The means are ample, and the diets are cooked in accordance with the recent regulations from the Secretary at War. Sufficient variety is allowed by this scale, which is strictly adhered to.
	16. The diet tables and diet rolls used in hospital are those issued by the Secretary at War. The forms are precisely the same as in England.
	17. The attendance in the European hospital is one hospital corporal, with an orderly (a soldier) for every 10 sick. A native cook and cooly are also allowed.
	18. The hospitals are in a good sanitary condition; no epidemic disease has ever appeared in the wards.
	19. The woodwork of the roofs of both hospitals was much decayed in parts, but they have recently been put in order. A quarter has been provided also for the hospital serjeant, Ceylon rifle regiment. The European hospital is a decayed antiquated building, and will not bear much alteration. A new structure ought to be raised in preference.
	20. There is sufficient ground near the hospitals to allow the patients to take exercise under the shade of trees, and seats are provided, but in the verandah only. No shaded walks are available for the men.
	21. Soldiers' sick wives and children are treated in their quarters. No provision has been made for them in the diet tables issued by the Secretary of War, and no hospital accommodation is provided for them. In consequence of this omission the women and children suffer, and a remedy is required, which would be afforded by their being permitted to be dieted in their quarters till hospitals with nurses are provided.
	22. The hospital regulations in force are those of the Secretary of War.
	23. The medical officer is entirely guided in matters appertaining to the sanitary state of the hospitals, by the regulations of the Secretary at War, and any suggestions he offers are attended to.
	24. There are no convalescent wards or hospitals here, and none are urgently required, although it would be desirable to have a part of the hospital so apportioned by proper authority.

References to Subjects and Queries.	Replies.
XIII. Burial of the Dead.	1. The burial-ground for British troops is close to the European hospital, but on a higher level. The south-west monsoon blows freely through it, clear of the hospital. 2. Its area is 3 acres, 1 rood, 33 perches. The soil and sub-soil is decomposed gneiss, which stands at a very steep slope. The ground is carefully kept. 3. The general space for a grave is seven feet by four feet, and the graves are put as close as possible together. They are from three to five feet deep, and are occasionally re-opened. The number of bodies in the same grave depends on the depth. There is no regulation as to interment, either at ordinary times or during epidemics, but an interval of 24 hours usually takes place between death and burial. 4. The grave-yard was never known to be offensive. The burial of British troops is conducted in every respect as in England. 5. The natives are buried in a ground about one mile distant from the town. The bodies of Buddhist priests and chiefs are burnt. 6, 7. No injury accrues to the public health from the present practice, and no improvement in the mode of disposal of the dead can be suggested.

(Signed) H. E. Weare, Bt. Lieut.-Col. 50th Regiment, Commandant.
J. MacGregor, Surgeon Major.
J. C. B. De Butts, Captain, R.E.

8th October 1860.

TRINCOMALEE.

Accommodation
- Queen's troops
  - Artillery - One serjeant, 23 rank and file.
  - Infantry - 50th Queen's Own Regiment.
  - - Nine serjeants, two buglers.
  - - 138 rank and file.
- Native troops
  - Artillery - Gun Lascars, one serjeant,
  - - One bugler, 44 rank and file.
  - Infantry - Ceylon Rifle Regiment.
  - - Nine serjeants, three buglers.
  - - 150 rank and file.

References to Subjects and Queries.	Replies.
1. Topography.	1. Near the station, the surrounding country is flat, but in the distance many lofty hills are seen. There are no swamps in the immediate neighbourhood, excepting a few "paddy fields," the nearest being about two miles distant. There is an abundance of wood and jungle in the vicinity of the station, and Fort Frederick is almost entirely surrounded by the sea. Fort Ostenburgh, situated at the western extremity of the range of hills so called, has the sea on three sides, and thick jungle on the fourth. The lines occupied by the native regiment are separated from the sea by a short street. 2. Fort Frederick is about 130 feet, and Fort Ostenburgh about 180 feet, but the native lines are only a few feet above the level of the sea. Fort Frederick is about 130 feet, and Fort Ostenburgh about 175 above the adjacent country; but the native lines are on a level with it. The native lines are about 150 yards from the sea, and there is a large tank supplied by the rains, about 600 yards from the latter, used solely by dhobies. There is no healthier ground near the station. The ridge of mountains on which For Ostenburgh stands at one extremity is a little higher than Fort Frederick. 3. The ridge of mountains alluded to in the foregoing answer is about two miles in length. The western extremity of the range is about two and a half miles from Fort Frederick, and is about two miles from the eastern extremity, which is the highest part of the ridge, and is about one and a half miles from Fort Frederick, and about 75 feet higher. 4. The sea washes the walls of Fort Frederick. Fort Ostenburgh has the sea on three of its sides, and the native lines are about 100 yards from the sea. No overflowing of water takes place in the vicinity of the station. There are no ravines, water pits, or broken ground near the station, but the water in the ditch on the land side of Fort Frederick, after a continuance of dry weather, is liable to become offensive; but neither Fort Ostenburgh nor the native lines are exposed to this inconvenience. 5. The station is open and freely exposed to the winds. No difference in the temperature of the station has been remarked from the buildings being exposed to reflected sun heat. The different barracks at the station are open to both land and sea breezes, both of which have a sanitary effect on the health, except the land wind during the night. 6. The surrounding country is uncultivated, and there are no works of irrigation near the station. There is but little land fitted for the cultivation of rice, and no restrictions are necessary. The nearest "paddy field" is about two miles distant. No indigo is cultivated, nor is there any cultivation of hemp or flax near the station. 7. The town of Trincomalee, containing a few Europeans and a considerable native population, is about half way between Fort Frederick and Fort Ostenburgh, about a mile from each. The native lines are in the town. 8. Quartz ridges, running north-east and south-west, intersect the country, and the low country is the alluvial deposit of these, and consists of sand and clay. The ground was occupied long previous to the present station being formed. 9. Water is found, during the dry season, at a depth of about 25 feet, and in the rainy season at a depth of about 20 feet below the surface. There are no wells at Fort Ostenburgh.

TRINCOMALEE. CEYLON.

References to Subjects and Queries.	REPLIES.
I. Topography—*cont.*	10. Fort Frederick and Fort Ostenburgh are well drained. The rain-fall flows readily away, and the drains empty themselves into the sea. At the native lines the rain-fall remains upon the surface until it is absorbed. There is no adjacent higher ground.
	11. At Fort Frederick and the native lines the water supply is derived from adjacent wells. Fort Ostenburgh is supplied from a well at the foot of the hill, about 350 yards distant. There is only one tank, which is at Fort Ostenburgh. Its dimensions are 60 feet by 9, by 9 feet 10 inches; but it is not in repair. The wells are so constructed that no leaves or other matter can fall into them to injure the water.
	12. The water supply appears to be inexhaustible. The water is good, has no peculiarity of colour, taste, or smell; is soft, and not injurious to health. It is drawn, at Fort Frederick, from wells in buckets, by coolies employed for that purpose. They carry it from the wells to the barracks in earthenware chatties. Owing to the distance of this well from the barracks, about 250 yards, up a very steep ascent, the labour is very fatiguing. This would be avoided by means of a force pump. No better supply could be obtained. The native troops have wells close to their lines and supply themselves, and the water at Fort Ostenburgh is carried by a cooly from the dockyard well. We do not know of any other means of supplying this fort, excepting by a force pump, which would in case of a siege be absolutely necessary.
	13. We are not aware of any other topographical points that are worthy of remark.
	14. No new stations, that we know of, have been selected.
II. CLIMATE.	1. There are no instruments for conducting and registering meteorological observations at this station, excepting a thermometer at the European hospital.
	2. There are no meteorological records going back beyond three years.

TABLE of Meteorological Observations for Three Years, from 1st May 1857 to 30th April 1860:—

Months.	Mean Temperature.	Mean Maximum.	Mean Minimum.	Winds.		Remarks as to Cloud, Wind, Dew, Storms, &c.
				Direction.	Force.	
January - -	78 1/3	83 1/3	73 2/3	N.E.	Moderate	Rain in small quantities.
February - -	81	85 2/3	77	Do.	Do.	Very little rain, with occasional thunder and lightning.
March - -	82 2/3	88 1/3	76 2/3	Do.	Do.	Do. do.
April - -	85 2/3	92	79 1/3	Do.	Do.	Do., with more thunder and lightning.
May - -	85 1/3	92 1/3	78	S.W.	Do.	Much rain, with thunder and lightning.
June - - -	86 2/3	93	80 1/3	Do.	High winds	Little rain.
July - - -	84 2/3	92	77 1/3	Do.	Moderate	Do.
August - -	85 2/3	92 2/3	78 2/3	Do.	Do.	Do.
September - -	85 2/3	93 2/3	77 2/3	Do.	High winds	Do.
October - -	85 1/3	91	76	Do.	Do.	Much rain, with thunder and lightning.
November - -	81 2/3	88 1/3	75	N.E.	Do.	Do. do.
December - -	80 1/3	85	75 1/3	Do.	Do.	Do. do.

3. Trincomalee is considered the hottest station in Ceylon. From March to August the atmosphere is dry and hot, with very little moisture, rain falling but seldom. No tree planting or irrigation is carried on, and there is nothing to affect the atmosphere excepting the land wind, which, passing over such a dense jungle, renders it unhealthy. The station is, however, so situated as to prevent the land winds from having much injurious effect. The diet, shelter, clothing, duties, drills, &c., at this station, are so regulated as not to interfere with the health of the troops. On minutely examining the returns kept at the hospital for a back period of several years, it appears that the monthly admissions so vary that it is impossible to say which are the most unhealthy months. The prevailing diseases are liver, dysentery, and intermittent fever.

4. The nearest station to this, which is considered more healthy, is Kandy, almost 120 miles distant, the road to which station is impassable for a wheeled conveyance. We are unable to give any information respecting its elevation, drainage, water supply, &c. &c.

5. Staff-surgeon Cogan is the only member of the board who has had any experience of the stations in this command. The Kandy district is the most salubrious, and that of Trincomalee the most injurious.

References to Subjects and Queries.	Replies.
III. Sanitary Condition.	1, 2, 3. Plans of the stations, surrounding country, and barracks are transmitted. 4. Table of barrack accommodation:— Date of construction, unknown. Total number of rooms or huts, 8 barrack-rooms and 150 huts. Total regulation number of non-commissioned officers and men, 305.

Barrack Rooms or Huts.	Regulation Number of Men in each Room or Hut.	Dimensions of Rooms or Huts.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height of Walls.	Cubic Contents in Feet.				Number.	Height.	Width.
		ft. in.	ft. in.	ft. in.				ft. in.		ft. in.	ft. in.
No. - - 1	87	186 0	20 0	13 6	63,240	727	42·75	1 8	12 32	3 6 1 6	4 2 1 6
2	88	186 0	20 0	13 6	63,240	718	42·27	1 2	12 32	3 6 1 6	4 2 1 6
3	87	186 0	20 0	13 6	63,240	727	42·75	1 2	12 32	3 6 1 6	4 2 1 6
5	40	83 0	20 0	12 9	27,805	695	41·50	1 2	6	3 4	4 2
6	45	96 0	20 0	12 9	32,160	715	42·66	1 2	5	3 6	4 2
58	89	190 0	18 6	10 6	48,452	545	39·44	1 2	20	5 0	4 0
C.R.R. single men 59	100	207 6	21 0	10 2	59,553	596	43·55	1 2	12	5 0	4 0
Do. married do. 59	1	9 6	11 6	10 0	1,308	1,308	109	1 2	1	3 0	2 0
Gun Lascars, single men - 59	25	60 0	21 0	10 6	17,640	705	50	1 2	14	5 0	4 0
Do. married do. 59	1	9 6	11 6	10 0	1,308	1,308	109	—	1	3 0	2 0
Total - -											
Fort Ostenburgh -	4	17 0	14 3	12 6	3,755	939	60	1 2	4	4 6	3 6
Guard room - -	12	37 0	17 6	12 0	7,724	836	53	1 6	8	7 0	3 10
Sally Port do. -	4	18 6	16 0	12 0	3,552	888	74	1 2	—	—	—
Ceylon Rifle do. -	4	20 0	11 4	10 6	2,946	737	58	1 2	4	4 0	3 0
Prison cells, each -	1	7 6	10 0	13 3	1,093	1,093	75	1 6	2	1 2	2 0

5. All the barracks at the station are so constructed that the windows are on opposite sides and open outwards. There are verandahs on both sides of all the barracks at Trincomalee, which extend their full length and are almost 9 feet in width. At each end of the different verandahs at Fort Frederick there are small rooms for married men, but no verandah in any of the barracks is used as sleeping quarters. There are jalousies at Fort Frederick, but none at any of the other barracks.
6. The bedsteads for Europeans, used in the barracks, are of iron, and each European is supplied with two pairs of sheets, one blanket, one rug, and a coir mattrass and pillow. The native soldiers have wooden cots, a cumlie, and a mat. We have no improvements to suggest.
7. There are no tents used at this station.
8. The ventilation of the buildings is effected by means of doors and windows opposite to each other, and in the European barracks by ventilators above and below, which produce a good circulation of air. These means are sufficient to keep the air pure, by night as well as by day. There are no other means used for cooling the air admitted into the barracks.
9. The barracks for Europeans are built of brick or stone and mortar, with tiled roofs. The native lines are constructed of mud, and also covered with tiles. Tents are not used here. The married native soldiers live in huts, which are constructed of mud, with tiled roofs.
10. The floors of the European barracks are generally made of satin-wood, and are raised about two feet above the level of the ground, with provision for a slight passage of air below. An asphalte floor has lately been laid down in the barracks at Fort Ostenburgh. The native lines have earthen floors, and there is no free passage of air beneath.
11. The materials of which the barracks are composed are very good. We think that all barracks should be ventilated along the ridge of the building, which would make them very much cooler, and would allow the impure air to escape. The barracks and cantonments are kept in repair by the Royal Engineer Department. The repairs are, however, very slowly executed, owing to the extreme backwardness of the place and the want of machinery. No one in particular is responsible for the sanitary state of the cantonment. The walls and ceilings of the barracks are cleaned weekly, and lime-washed when necessary.
12. There are two baths in Fort Frederick, of which a plan is transmitted. The water for them is supplied by carriers, and escapes by an open drain into the sea. The natives bathe in the sea. There are no lavatory arrangements at Fort Ostenburgh.
13. A plan of the barrack cook-houses is transmitted. They are supplied with iron boilers, and in each kitchen at Fort Frederick and Fort Ostenburgh there is a range, built of brick, on which smaller cooking utensils are used. The native soldiers have no cook-house. There is an ample supply of water, and the drainage at the European barracks is good. The refuse water at the native barracks is absorbed in the earth. The linen of all the troops is washed by the native dhobies.
14. The privies, of which a plan is transmitted, have soil-pits from 8 to 14 feet deep, and the urinals generally are near a privy, with a drain leading into its soil-pit.
15. These buildings are ventilated by means of doors and windows, which are opposite each other, and are lighted at night by oil lamps.
16. At the two forts the rain is carried from the barracks to the sea by open drains, which are of sufficient dimensions for the purpose, and in no case is the distance to the sea

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References to Subjects and Queries.	Replies.
III. Sanitary Condition —*cont.*	more than 250 yards. There are no sewers or drains at the native barracks. The drainage at the forts is generally sufficient. Most of the buildings are very damp in wet weather, the roofs not being water-tight. All fluid refuse not carried away by drainage evaporates on the surface. There are no cess-pits, neither are there any foul ditches, except the one at Fort Frederick, which is only offensive after a continuation of dry weather, and then but for a short time, as the water soon becomes absorbed. 17. The surface cleansing of Fort Frederick is performed twice weekly by strong fatigue parties. It is efficiently done, and the refuse, &c., is thrown into the sea at some distance from the fort. Fort Ostenburgh and the native lines are surface cleansed daily, and the refuse from them is also thrown into the sea. 18. The immediate proximity to all the barracks is kept free of vegetation, but the slopes of the hills round the two forts are thinly covered with jungle. There are no old walls, thick hedges, &c., interfering with the ventilation of any of the barracks. 19. The bazaar occupied by the natives is about one mile from Fort Frederick, about two miles from Fort Ostenburgh, and half a mile from the native lines. It appears to be kept very clean, and is well ventilated and drained. All bazaar arrangements and regulations are entirely in the hands of the civil power. Cleanliness appears to be strictly preserved. To all outward appearance the native houses are neat and clean. Manure and other refuse is carried to a large common at some distance from the town. No nuisance is experienced in barracks from wind blowing over the native dwellings. 20. All arrangements for the slaughter of animals are in the hands of the civil power. The slaughter-house is a considerable distance from the barracks, and no nuisance is experienced in the station from its condition. 21, 22. There are no bazaar horses at this station, neither are there stables nor picketing grounds for cavalry or artillery horses. 23. The accommodation for European married non-commissioned officers and men is insufficient. There are no married men in the barrack rooms at present, but an increase of one married family would cause inconvenience. The quarters constructed for the married non-commissioned officers and men of the native troops are sufficient.
Officers' Quarters.	1. The officers' quarters are generally good and well drained, but the same complaint exists as with the other buildings—the roofs are not water-tight. As these quarters are all situated in the hottest part of the fort, we would suggest that they should be two-storied.
IV. HEALTH OF THE TROOPS.	1. The district in which the station is situated is considered to be one of the most unhealthy in Ceylon, yet the mortality is not so great as might be expected. The adjoining native population is not healthy. 2. Intermittent fever and bowel complaints are most prevalent among the native population, and small-pox occasionally breaks out amongst them. 3. These diseases are attributable to the climate. 4. The two companies of the 50th Regiment came here from Kandy, where they were stationed upwards of two years, and left it in September 1859. They were not subject to any particular disease in Kandy, and on their arrival here they were generally healthy. The artillery arrived here in January 1859 from Colombo, where they had disembarked three weeks previously from England, and they were also generally healthy. One company of the Rifles came here in 1856, and the other in 1858, from Colombo. Three years is the average length of time at each station. The Europeans have chiefly suffered from liver diseases, dysentery, and fever, and the natives from the two latter, since their arrival at this station. No part of the men's present accommodation appears to be more unhealthy than the rest. 5. The troops at this station are never camped out. 6. Staff-surgeon Cogan, one of the members of this board, has twice been stationed at Newera Ellia, the only hill station in the island. The result of his experience is that the health of invalids rapidly improves by removal from the plains to hill stations. 7. Staff-surgeon Cogan is not aware that troops returning from the hills to the plains are more or less liable to attacks of febrile and other diseases. 8. After a length of service in the island, Staff-surgeon Cogan approves of selecting hill stations for troops. 9. There are no diseases peculiar to hill stations, that we are aware of, to which troops are liable to be attacked on going to them, except those arising from too great exposure to cold. 10. Every precaution is taken for the preservation of the health of the men, and they certainly do derive great benefit from a residence in hill stations. 11. The time best adapted for a residence in the hills is from January until May; but we have not had sufficient experience to say what is the shortest period of residence in the hills which would enable troops to obtain the full benefit to their health. 12. There is no period of residence in hill stations, that we are aware of, beyond which injury is likely to be inflicted on the health of troops on their return to service in the plains. 13. No precautions are required in this island for protecting the health of troops on their leaving hill stations for the plains. 14. As the hill station is a small one there is not sufficient accommodation for many of the troops. We are of opinion that an occasional change from the plains to the hills would prove most conducive to the health of the troops, and we would strongly recommend that the reliefs should take place more frequently. Frequent change of stations in the plains is beneficial to the health of the troops. 15. The barrack and hospital accommodation is sufficient for the small number of troops stationed at Newera Ellia, but no provisions have been made in the shape of games and exercises for the men, which would relieve the monotony at such a lonely station. 16. No greater or more commodious elevation than that of Newera Ellia can be found in Ceylon. It is upwards of 7,000 feet above the level of the sea. 17. There is no higher ground near this station which could be advantageously occupied as a hill station.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*cont.*	18. We have found no difference in the healthiness of stations from the different classes of their surface and subsoils. 19. Soldiers should certainly not be sent to India under 20 years of age, and they should land there between October and January. The men on disembarkation are marched direct to their barracks, where everything necessary has been already prepared for them. They are supplied with white clothing and taken on the regimental roster at once. I would recommend recruits on first landing in India to avoid the sun as much as possible. 20. We have no experience to say whether troops should be sent direct from the home depôts to India, or sent first to some intermediate station for a certain time. It would certainly be advantageous to send new arrivals to the hills, but in Ceylon this would be impracticable. 21. Troops landing in Ceylon are marched from the port to the interior, and the hours of marches are so arranged as not to expose the men to the effects of the sun. 22. From my experience, I consider that a British soldier should serve from seven to ten years in India, not longer. 23. The manner of conducting medical boards is not such as to avoid conflict of opinion as regards invaliding, but we have no suggestions to make. 24. Invalids proceeding home should leave India so as to arrive at their destination at the commencement of the summer months.
Diseases.	1. There are inspection parades for the discovery of incipient diseases at this station every Saturday, and on Sundays for the native troops. 2. Scorbutic disease is of rare occurrence in the island, and preventive measures are consequently unnecessary; but should it make its appearance at any time, oranges, lime juice, and vegetables are the best prophylactic. 3. During the last 10 years there have been 4,002 Europeans admitted into hospital, of which cases 172 were hepatic diseases, of which 15 were fatal. Amongst the native troops for the same period there were 2,787 cases admitted, nine of which were hepatic, and two of which died. The climate alone is generally the cause of this disease, and we are not aware of any prophylactic measures to diminish its frequency. 4. No case of dracunculus has occurred amongst the troops during Surgeon Cogan's experience in the island, which embraces a period of more than seven years. 5. Out of the 4,002 cases admitted into hospital, amongst the Europeans for the last 10 years, 186 have been from venereal diseases; and out of 2,787 cases amongst the natives, for the same period, there have been 47 cases of venereal treated. There have been no deaths. No precautions can be suggested for diminishing the liability of soldiers to this disease. Lock hospitals would not be advantageous. 6. The troops at this station suffer from the following diseases, viz. :— *Fevers.*—Intermittent fever is most prevalent, but is not of a very serious character when treated in its first stage. *Dysentery* is of common occurrence at certain seasons, and is generally of a very severe form. *Cholera.*—No case during the last 18 months amongst the Europeans, and only seven cases amongst the natives during the last 10 years. *Small-pox* is almost unknown among the European troops, and there has been no case of this disease amongst the native troops since 1855. *Rheumatism* has been of rare occurrence lately. The following table shows the proportion which admissions and deaths from these diseases have borne to the total admissions and deaths for the last 10 years :—

Diseases.	Troops.	Total Number of Admissions from each Disease.	Total Number of Deaths from each Disease.	Total Number of Deaths from all Diseases.	Total Number of Admissions from all Diseases.
Fevers	European	1,338	19		
	Native	1,393	6		
Dysentery	European	335	32		
	Native	28	2		
Cholera	European	9	3	Europeans - 89	Europeans - 4,002
	Native	7	5	Natives - - 28	Natives - 2,787
Small Pox	European	—	—		
	Native	10	2		
Rheumatism	European	181	—		
	Native	148	—		

	7. The more frequent zymotic diseases are—intermittent fever, dysentery, and diarrhœa, of which dysentery is the most virulent. They vary according to the seasons, and a sudden change of weather from wet to dry, *or vice versâ*, generally precedes or accompanies their appearance. There are no bazaars or native dwellings within one mile or thereabouts of the European barracks. The sanitary condition of those portions of the station, bazaar, &c., near the native lines is good. No personal habits or conditions among the troops or the native population have been remarked to predispose to the above-mentioned diseases. 8. The soldiers' duties and occupations in barracks do not appear to have any influence in contracting any diseases. 9. Small doses of quinine have not been tried at this station as a prophylactic against malarial diseases. 10. Owing to the nature of the climate we are unable to suggest anything that would prevent or mitigate epidemic disease.
V. Intemperance.	1. With a few exceptions the soldiers at this station are temperate, and the per-centage of confirmed drunkards among them is about four per cent. 2. During the last 10 years there have been 49 cases (out of 4,002) admitted into hospital from diseases caused directly by intemperance amongst the Europeans, but none

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References to Subjects and Queries.	REPLIES.
V. Intemperance—*cont.*	amongst the natives. It is found almost impossible to go back more than 20 months for information; but during that time there have been eight cases (out of 411) admitted for diseases caused indirectly by intemperance. Intemperance is almost unknown among the native troops, on account of their religion. There are no records at this station that will enable me to show what effect total abstinence, temperance, and drunkenness have on the amount of sickness, mortality, and crime at this station. Drunkenness is always punished as an offence. 3. Distilled spirits are sold both at the canteens and in the bazaar. The quality of the arrack at the barrack canteen is good, but that sold in the native bazaar is very bad. It is impossible to say what amount is consumed out of barracks, but at the military canteen no man is allowed to exceed. Spirit does not form part of the ration for soldiers either at the station, on the march, or in the field, but it is given to convalescents, according to the discretion of the medical officer. No injurious drinks, other than intoxicating drinks, are sold either at the canteen or bazaar. 4. Spirit is never given to convalescents unless it is considered conducive to their health. Its consumption by the troops, when carried to excess, is certain to prove injurious, but when taken in moderation it is conducive to the efficiency and internal discipline of the corps. 5. Total abstinence would be likely to prove injurious to the health of troops. 6. Malt liquor is far preferable to spirits, but wines are not procurable at this station. 7. Coffee and tea are used here morning and evening, and are indispensable as far as regards the men's diet, but lemonade, soda-water, &c., are not available. 8. There is no spirit ration here. 9. A small quantity of spirits is considered necessary for the troops. 10. I have no further recommendations to make on these points. 11. The canteen regulations are as follows:—No European or native, except the garrison, is allowed to enter the canteen without authority, nor is any liquor allowed to be taken out except under the following rules:—(1st) To a married man to the extent of one bottle of wine or one quart of beer daily; (2ndly) to companies messing in barracks, on the requisition of orderly officers of regiments, at the hour of dinner only, and then not to exceed one pint per man, or half a bottle of wine; and (3rdly) upon an order from the officer of the garrison or standing order from the commandant or staff officer. The canteen is open from twelve to one o'clock at noon, and from half-past five to eight p.m. It is closed during Divine service on Sunday. No one is allowed to enter the canteen while in liquor. No man is allowed to take liquor at the bar (except at twelve at noon, when it is peremptory) or at any other place excepting at the table, where it is delivered by the canteen attendant. All liquor issued from the canteen must be paid for on delivery.
VI. DIET.	1. The ration for Queen's British troops is composed as follows, viz., 1½ lbs. of fresh meat, or 1 lb. of salt meat, 1 lb. of bread, 1½ oz. sugar, 1½ oz. coffee, or ¼ oz. tea, 1 oz. salt, and 4 oz. rice. Salt provisions are issued twice per month. The rations are inspected previous to issue by a commissioned officer. 2. A complete ration, with vegetables (when procurable) is provided for the troops. The stoppage is 3½*d.* for the commissariat, and 2*d.* for extras, daily. The soldier takes three meals per diem. Breakfast at eight a.m., of tea or coffee and bread; dinner at one p.m., of soup, meat, rice, and vegetables, and supper at six p.m. of bread and tea or coffee. The foregoing refers to Europeans; the native troops diet themselves. The proportion of vegetables that enters into the composition of the ration varies, not being procurable every day. 3. The ration is quite sufficient in point of quantity, and it is of as good quality as can be procured. The rations are never disposed of at this station. 4. The means of cooking, available at this station, consist of large iron boilers placed on brick ranges and wooden fires. The kitchens are clean, light, well-ventilated, and well supplied with water. The food consumed by the troops here is generally boiled. The cooking is properly done, but there is no great variety. Tea and coffee are properly prepared for the men, and they have the latter beverage always before a march. 5. Gardens for the cultivation of vegetables by soldiers could not be advantageously established near the station, as the nature of the soils and climate would not admit of the cultivation of vegetables.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldier's dress at this station is composed as follows:—Jacket, trousers, and cap cover made of white American drill, in which all the duties are performed. The accoutrements are according to regulation. The present dress is suitable to the climate, and for the soldiers' duties by day and night, and we cannot suggest any improvement in it. The guards mount in white, and the sentries are protected from the sun and wet by verandahs and sentry boxes.
Duties.	1. Men should be thoroughly drilled at home before being sent to India. 2. The usual routine of the soldiers' duties at this station is as follows:—Parade at 6 a.m. and 5 p.m., each lasting from 30 to 45 minutes; guard mounting, and the usual fatigues. Their duties do not affect the health of the men. The above are the best hours for drills and parades, and there is a general order relative to the marching of troops in the morning. The average number of nights the men at this station have in bed during the week is four. 3. The guards are all mounted in their own barracks at 6 a.m. daily, and remain on duty 24 hours. Three guards, viz., the dockyard, the Cutcherry, and the Admiralty guard, mounted daily by native soldiers, are a considerable distance from their barracks. There are roll calls at ½ past 10 a.m., at every meal, and at tattoo. The night guard does not appear to affect the health of the troops. In case of inclement weather the sentries wear their great coats. The native troops have roll calls at 6 a.m., at midday, and at tattoo.
VIII. INSTRUCTION AND RECREATION.	1. There are two schools at this station, one for Europeans with a schoolmaster of an ordinary description, one for native soldiers with an indifferent schoolmaster; a library and reading room, which is also used as a day room, sufficiently lighted at night, and well supplied with books in Fort Frederick. There is also a theatre, but neither ball

References to Subjects and Queries.	Replies.
VIII. Instruction and Recreation—*cont.*	courts, skittle grounds, soldiers' gardens, workshops, or gymnasia. The library is the only resort for the troops in hot or wet weather, and in addition to the books it contains chess, backgammon, and other amusing games. The men are not allowed outside the forts until after evening parade, after which time the sun does not affect their health. The native troops are not so much confined to their barracks, nor do they feel the effects of the sun as do the European troops. 2. We suggest there should be gymnasia, a covered ball court, and skittle grounds for Europeans and gardens for the native troops. 3. There are regimental savings banks for the Europeans, which have proved highly advantageous, but no such institutions exist for natives. 4. There are verandahs and trees, but the heat is too great at this station to admit of exercise being taken during the day.
IX. Military Prisons.	1. The military prison is in a most healthy locality, well ventilated, and is in every way suited for the purpose for which it is intended.
X. Field Service.	1. There are no local regulations for field medical service not included in the general presidency regulations. 2. Any means thought necessary by the medical officer to preserve the health of the troops on a line of march he suggests to the officer commanding. 3. The men at this station are never encamped. 4. There are no arrangements adopted for field hospitals, transport of sick and hospital supplies, ambulances, &c., &c.
XI. Statistics of Sickness and Mortality.	No information under this head.
XII. Hospitals.	1, 2. The new European hospital, which is not yet occupied, is situated in the lower part of the fort, and is about 300 yards from the men's barracks. The native hospital is adjoining the barracks. There are no stables at this station. The bazaar and the houses of the civil population are nearly one mile from Fort Frederick hospital, but the native hospital is very near the civil population, and about one mile or thereabouts from the bazaar. The site of the European hospital hitherto unoccupied is partly open; but there are trees, buildings, mounds, &c., which interfere with the ventilation. The native hospital is, however, open and freely ventilated. We are of opinion that the site of the former is unhealthy as to elevation, but the drainage appears to be sufficient, and there are no river banks, or marshes, &c. in its neighbourhood. The site of the native hospital is good, and there are no ditches, nullahs, marshes, foul ground, &c., near it. 3. The water is abundant and wholesome. 4. The European hospital has not yet been occupied. Judging from appearances the drainage is sufficient, and the refuse water, &c., is emptied into the sea by drains. There is no drainage at the native hospital. 5. The centre of the roof in the European hospital is 21 feet from the ground, with a free perflation of air underneath the floors. The floor of the native hospital, which is made of cow-dung, is about six inches above the ground, and there is no perflation of air beneath. The roof water of the European hospital is carried away by drains into the sea; but at the native hospital it sinks into the subsoil. The surface drainage and guttering round the hospital are quite sufficient to carry away the rain-fall rapidly. The European hospital is composed of brick and mortar, with single roof and walls. A space is left along the wall plate, and trap-doors are provided in the walls near the ground, which ventilate to some extent; but the wards might be made cooler by adding a canvass ceiling. The native hospital is a temporary building with mud walls, and a cadjan or cocoa-nut leaf roof. The walls are single, but are sufficient to keep the building cool. The buildings are supplied on both sides with verandahs about 9 feet in breadth, which afford sufficient shelter from the sun's rays. The verandahs are never used for the accommodation of sick, convalescents, or others. The hospital consists of one flat.

Table of Hospital Accommodation.

Date of construction		European hospital, commenced 7th March 1853. Not yet occupied. Native hospital unknown.
Total number of wards	European hospital	3
	Native ditto	2
Total regulation number of beds	European ditto	40
	Native ditto	20

Hospital Wards. No.		Regulation No. of Sick in each Ward.	Dimensions of Wards.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
			Length.	Breadth.	Height of Walls.	Cubic Contents.				Number.	Height.	Width.
			ft. in.	ft. in.	ft.	ft.	ft.	ft.	ft. in.	ft.	ft.	ft.
European	1	14	52 0	21 0	17	22,386	1,500	78	1 8	13	7	3
	2	14	52 0	21 0	17	22,386	1,500	78	1 8	13	7	3
	3	12	53 0	16 0	17	17,384	1,500	70·33	1 8	13	7	3
Native	1	8	19 4	17 2	13	5,634	704	41	1 8	4	5	3
	2	12	48 0	17 2	13	13,872	1,156	68	1 8	8	5	3

The hospitals are not placed so as to receive the full benefit of prevailing winds. The windows all open outwards, and we are of opinion that in the European hospital their arrangement would be improved by their being nearer the ground, and venetians substituted in the place of glass.

6. In the European hospital there are ventilators on each side of the wards, both above and below the flooring; but should it be found necessary to keep the windows in their present form closed, the ventilation would be insufficient. The native hospital is sufficiently ventilated. There are no jalousies or jhilmils.

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	XI. Hospitals—*cont.*	7, 8. There are no means either for cooling or warming the air admitted into the wards, and the latter is not at all necessary. The walls and ceilings of the hospitals are cleansed and whitewashed when thought necessary by the medical officer in charge. 9. The privies are built of the same material as the hospital, and are placed over cess-pits without drainage. From the position of the privy at the new European hospital, we fear it will eventually prove offensive. 10. At the European hospital a room is applied for lavatory arrangements, but there is no such provision at the native hospital. The patients use tubs in the verandah, and convalescents are allowed to bathe in the sea. 11. The means for bathing the sick are neither sufficient nor convenient. 12. The washing and drying of the hospital linen are performed by the native washermen, of whom there are no complaints. 13. The storage is sufficient and dry. 14. European invalids are provided with iron bedsteads with sacking bottoms, and the natives have wooden cots, but all are provided with mattresses, pillows, sheets, blankets, and coverlids. We have no improvements to suggest. 15. The European hospital kitchen is in the back range of the building, and the means and apparatus for cooking appear to be ample. This is applicable to the native hospital also. 16. Copies of the diet rolls, diet tables, &c., are transmitted. 17. There is a hospital serjeant, assisted by one orderly, at each hospital, which is sufficient attendance for the average number of patients. 18. The sanitary condition of the barrack used as a hospital for the European sick and of the native hospital is good, and no epidemic disease, hospital gangrene, or pyæmia have appeared in the wards. 19. In the present temporary hospital for the European sick there are many deficiencies, which will not exist in the new one when completed. There are many deficiencies in the native hospital, and the building not being suited for its purpose, I would suggest its removal to a more suitable site, and its accommodation bineg made more commodious. 20. The verandahs are the only places for taking exercise. There are no shaded walks or seats set apart for the use of convalescents. 21. The sick wives and children of the soldiers attend at the surgery for casual complaints, or, if their case require it, the medical officer attends them at their own quarters. No improvements in the present arrangements are necessary. 22. There are no special local hospital regulations which are not included in the general army medical regulations. 23. The medical officer can only report on the necessary repairs of the hospital, and forward requisitions accordingly, but he has discretionary power regarding the change of diet and the issuing of medical comforts. 24. There is no convalescent ward or hospital for convalescents at the station, nor is there any advantage in having one.
	BURIAL OF THE DEAD.	1. The burial-ground for British troops is about three-quarters of a mile distant from the station, and its position to the latter is such that the prevailing winds have no effect on the health of the troops. 2. The area of the burial-ground is nearly three acres. The soil is chiefly sand, and there is no drainage but that which is natural, and this is found to be sufficient. Decomposition takes place neither very readily nor very slowly. The ground is walled in and is carefully kept. 3. The space allowed for a grave is nine feet in length by three feet in width, and the ordinary interval between the graves is three feet. They are dug six feet deep. The area of the ground is so extensive that graves are never designedly reopened, but when one is accidentally reopened it is in ground which has been undisturbed, as far as can be ascertained, 15 years and upwards. Interment is compulsory from 12 to 18 hours after death. No epidemics have occurred in our time. The natives are buried according to their own religion by their friends. 4. The graveyard is never offensive. 5. There are no camp followers or bazaar people at this station. 6, 7. No injury accrues to the public health from the present practice, nor are there any improvements to be suggested.

(Signed) F. HAMLEY, Major, 50th "Queen's Own" Regiment, Commandant, Trincomalee.
F. COGAN, Staff Surgeon.
G. N. KELSALL, Captain, R.E.

September 3, 1860.

GALLE.

Accommodation — Queen's Troops — Artillery - 42; Infantry - 141
Accommodation — Native Troops — Artillery - 6; Infantry - 176

References to Subjects and Queries.	REPLIES.
I. TOPOGRAPHY.	1. The aspect of the country surrounding the station is undulating and pleasing to the observer. The hilly parts are covered with a thick luxuriant jungle, interspersed with trees of various kinds, whilst the lower portions are thickly studded with cocoa-nut trees, which grow to the water's edge, and are swampy. There is plenty of jungle, wood, and water in the vicinity. 2. The elevated part of the station is 20 feet above the level of the sea, but the elevation of the adjacent hilly country is greater than that of the station, the average height of the hills being 130 feet above the sea. The elevated part of the station is about 25

References to Subjects and Queries.	Replies.
I. Topography—*cont.*	feet above the nearest canal. The surrounding undulating country is higher than the station, but the site of the latter is equally healthy. 3. The nearest mountain, known as the Haycock, is distant about 40 miles from, and about 3,350 feet above the level of, the station. 4. The sea washes up to the fort walls, and is, therefore, the nearest water. There are also a river, named Ginduruh, the nearest mouth of which is about one and a quarter miles from the station, and a canal about 200 yards from the fort. In parts, the vicinity is liable to overflow in the wet season (*i.e.*, during the months of October, November, December, May, and June), but they are seldom under water for more than a couple of days at a time. There are no ravines, water pits, &c., near the station. 5. The station is freely exposed to the south-west wind, which prevails during six months of the year, but the free circulation of the north-east wind, which prevails during the remaining six months, is somewhat impeded by the fort walls. The temperature of the station is not raised by exposure to reflected sun-heat. The station is exposed to both land and sea breezes. The land wind that blows during the night at certain seasons should be avoided, as it has been known in many instances to paralyze the limbs. The sea breeze is beneficial to health. 6. The surrounding country is in parts cultivated, but there are no works of artificial irrigation near the station. The cultivation of rice within 250 yards of the station is prohibited by the military authorities, who exercise a right of control over this land, and will not allow it to be cultivated. Indigo is not cultivated, nor the preparation of hemp or flax carried on near the station. The preparation of the cocoa-nut fibre, however, is carried on at a distance from the station of about one and a half miles, and the odour arising from the stagnant water in which the husks are soaked is very offensive. 7. There is no large city in the vicinity of the station. The native population within Galle, which comprises an area of 36 square miles, is,—males, 11,700, and females, 11,250; total, 22,950. The native town commences at about 450 yards from the fort, and there is also a native town within the fort. 8. The geologic condition of this district is as follows:—The surface soil is of red sand and gravel, termed cabook, with black earth in some parts, and this is mixed with a quantity of rock of a granitic character. The subsoil is slightly argillaceous, based on rock of the same granitic formation, mixed with coral. 9. Water is usually found, in the dry season, at a depth of about 15 or 16 feet, and during the rainy season, at a depth of about 10 or 11 feet below the surface. 10. Part of the rain-fall sinks into the subsoil of the station, and so drains off, and part evaporates. There is no drainage from higher ground passing into the subsoil of the station. 11. The water supply of the station is derived from wells, but there are no tanks. The water used for drinking purposes is free from pollution. 12. For the use of the troops there are six wells, with an average diameter of six feet, and the average depth of water in which is, in the wet season, four feet, while in the dry weather it seldom exceeds two feet. The water from the wells is only used for cooking purposes and for ablution. All drinking water is either purchased by the troops or procured by means of matboys (soldiers' servants). The water is brought from a well about 650 yards from the fort. The water obtained from the wells within the fort has a brownish tinge, is slightly brackish, and has an earthy smell. We have no means of testing its chemical qualities or of ascertaining its microscopic character. The quality of the water obtained from within the fort is such as to render it unfit for drinking, but that from the wells outside is good and sufficient. The water from the wells is usually drawn up in hand buckets. The supply could be improved by means of pipes, which might be laid down from the wells outside; but this would be at a considerable expense. 13. The station is remarkably healthy, and there are no other topographical points bearing on its health to be remarked on. 14. No new stations have been selected, either on hills or plains, within our experience.
II. Climate.	1. There is no thermometer, barometer, rain-gauge, or other instrument at the station for conducting meteorological observations, and the subject has not been much examined into in former years; but I have arranged, from the data in my possession, such facts as the returns will admit of. From examining several years of observation on the rain, I should conclude that it rains on an average about 180 days in the year; but having been here only two months and some days, I cannot give any clear explanation of the amount of rain which falls during the year. 2. Table of meteorological observations:—

Months.	Barometer Mean.	Mean Temperature.	Mean Daily Range.	Mean Maximum.	Mean Minimum.	Mean Dry Bulb.	Mean Wet Bulb.	Mean Sun Temperature.	Rain, inches.	Winds. Direction.	Winds. Force.	Days of Sunshine.	Remarks.
January	–	80	–	84½	78	Not tested.				Not in returns; but the N.E. and S.W. monsoons occur at stated regular periods.	Not explained with any accuracy.	It would appear from the returns that it rains on an average 180 days in the year.	Thunder storms of great severity, with thunder, rain, and tempestuous winds occur during the S.W. monsoon, and in the intervals oppressive heat prevails, relieved by the sea breeze, which acts most agreeably on the atmosphere.
February	–	79½	–	84	78¼								
March	–	80	–	84	77½								
April	–	82	–	85	78								
May	–	82½	–	84½	78¾								
June	–	82	–	84¼	78¼								
July	–	81½	–	84	77¾								
August	–	81	–	84	78								
September	–	81	–	84	77½								
October	–	80	–	85½	77¼								
November	–	80	–	83	77								
December	–	79	–	83½	77½								

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References to Subjects and Queries.	REPLIES.
II. Climate—*cont.*	3. The climate of this station is variable, but the variations are extremely regular. There are two seasons or monsoons—one commencing in May and ending in October, while the other lasts, as a general rule, from November to April, and between these there prevails a season of dry heat from February to May. The climate of Galle is marked by being very damp at all periods, everything being soon covered with a blue mould. This peculiar condition arises, I think, from the quantity of rain which falls during the year. I do not attribute it to the trees, which are numerous over the district, or to the irrigation or non-irrigation which exists in the surrounding neighbourhood; and the air, as a general rule, is not, I believe, charged with any atmospheric admixture injurious to the health of the troops. The men are clothed judiciously, and the barrack-rooms are large and lofty and cool, considering the great heat which prevails outside the buildings. Parades are ordered at such hours as are suited to the climate and the health of the soldiers serving in it. It would appear that May is the most unhealthy month, and April the next, but not in a very marked degree. The heat is generally greater at this period of the year, to which, I suppose, the amount of sickness is to be attributed. The prevailing forms of disease are fevers, affections of the stomach and bowels, and catarrh. The first may be referred to the heat, and the catarrhal affections to the indiscreet exposure at night, after the great heat generated during the day, the men throwing off all covering and getting chilled in consequence. At this period also the men eat a quantity of fruit, probably unripe and indigestible, and thus affections of the bowels are often produced. 4. There is no district at or near this station more eligible than the present, compatible with the defence of the station (which must have its due weight), to which the troops could be removed. This station is generally considered to be healthy. Having been less than three months in the colony, I have no further suggestions to make. 5. I have not served at any other station in this colony than the present.
III. SANITARY CONDITION OF STATION.	1, 2, 3. Plans of the station, with the barracks and Malay lines, are herewith transmitted. 4. TABLE of Barrack Accommodation. Total number of barrack-rooms, 2. Total regulation number of non-commissioned officers and men, 99.

Barrack-Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		ft. in.	ft.	ft. in.			ft.	ft. in.		ft. in.	ft. in.
Barrack-room not occupied by European troops.	53	106 6	27	16 6	62,542	1,180	54	1 7	8	6 5	7 0
Barrack No. 2 -	46	94 0	27	16 6	55,201	1,200	55	1 7	8	6 5	7 0
Guard-room - -	23	48 0	21	15 2	19,152	833	43	—	5	5 5	5 3
Prison cells - -	1	9 8	6	7 3	425	425	58	—	4 Ventilators.	8 0	20 0

5. The windows of the rooms are on opposite sides, and consist of an open grating, which admits a large amount of air. These do not open outwards, but there are shutters attached to each, which are capable of being opened or closed, as is most convenient. On both sides of the barrack-rooms there are large verandahs, extending their whole length. The front verandah is 9 feet broad, and that at the back 9 feet 4 inches. They are not used as places for the soldiers or others to sleep in. There are no jalousies to the barracks; but, as I have above mentioned, an open grating with shutters.

6. The bedding for each man consists of one blanket, one rug, two sheets, one mattress made of coir, and two pillows of the same material. This makes a mattress of a firm, uniform nature, which is of as cool and smooth a quality as any substance generally used. These remarks apply chiefly to the European soldiers' quarters, and I have no further suggestions to offer.

7. There are 25 tents in the commissariat store at this station—12 small and 13 large. The small tents contain a cubic space of 1,132 feet, and the large 1,800 cubic feet each, and are constructed of canvass, having a lining of blue serge. Many of them are out of repair, but still capable of being made serviceable. The small tents are returned as intended for 10 men in each, and the large are constructed for 20 men each. I should consider that six men in the small and 15 in the large would be more compatible with the preservation of health in this climate

The tents are very defective in point of ventilation, having no means of admitting air but the doors. The barrack-rooms have no other means of ventilation than the doors and windows, but if a few openings were made in the side walls, I am of opinion that the purity of the air would be improved. The only way of cooling the rooms is by sprinkling water occasionally over the floors and doorways. The guard-room is of the most convenient description. It is large and airy, and has five large circular holes made in the walls for ventilation. The cells are dry, and of the usual dimensions, with two openings in each, facing the sea. One of these is grated, and opposed to them are two oblong openings, on a lower level, on each side of the door of each cell, so that I think they may be considered as being well adapted to the purpose intended.

9. The barracks are constructed of bricks, stones, and a species of mortar, with laths or sticks interlaced.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of Station—*cont.*	10. The floors are made of tiles and bricks, and have a stone paving running through the centre of the rooms. They are not raised above the level of the ground, that is to say, there is no room for the passage of any air beneath them.
	11. The barracks are built of solid masonry, on the Dutch principle. I believe that brick walls will keep out heat, and I must state my opinion, that, as a general rule, the barrack-rooms are as cool as in this climate could be expected. The floor of one barrack-room of the Ceylon rifles is made of sand, and I think a brick paving to it would be a decided improvement. The barracks are kept in repair by the Engineer Department, on requisition made by the Assistant Quartermaster-General. The medical officer is responsible for the general sanitary state of the barracks, and he makes any suggestions which may appear necessary to the commanding officer. There are no stated times for lime-washing the barracks, but it is done as often as is considered desirable. The walls are kept clean by the men.
	12. There are no large baths provided for the men at this station, but they bathe in the sea twice a week. The lavatory is a square building, with a stone flooring and a large channel running down its centre, which affords free drainage to the refuse water. It is open all round between the roof, which is tiled, and the body of the building, by which means a sensation of coolness is perceived on entering. The building is furnished with eight washing tubs for the men. The water for washing is obtained from the wells in the fort, and conveyed by puneins kept in the barracks for that purpose. The water for drinking purposes is obtained from the wells outside the fort.
	13. The cook-house at the 50th's barracks is constructed under a verandah, which is kept waterproof. It is close to the men's lavatory, and a channel of communication for the purpose of drainage is established between them. The cooking is performed by natives. The washing of the men's linen is performed by natives outside the fort.
	14. The privies for the men are built over the shore; the sea at high tide washes completely underneath them, and thus the places are kept in a pure state. At night the men have urine tubs in their rooms or in the barracks. These are removed every morning at early dawn to a place erected for the reception of their contents. There is a sort of tank, which is connected with the main sewer, which empties itself into the sea, and no perceptible nuisance of importance arises from this source.
	15. The barrack-rooms are ventilated by large grated windows and doors, and are lighted by two large lamps suspended from the ceiling. These do not afford the men sufficient light to read after dark.
	16. On each side of the men's barracks runs a broad, but not deep drain, with sides and bottom of brickwork, which carries the refuse water from the cook-house into a deep sewer, having communication with one of the main sewers of the fort, which carries all refuse matter into the sea. The sea does the duty of scavenger to the privies, and the urinals are removed from the barrack-rooms at daylight to a cesspool which is in connexion with a main sewer. The ground in front and rear of the European barracks is flat, and wants draining, as after rains the water collects and remains on the surface, causing, doubtless, an increase of dampness in that quarter. There is a projecting wall at one side of the hospital, which receives the droppings from the eaves of the buildings, and which has been noticed to generate dampness. A verandah on this side would be very beneficial, and it would have the effect of carrying the drainage from the roof beyond that point. There is only one cesspit connected with the barracks. It is not emptied at any time, but discharges itself into the general drain leading to the sea. The fort has a broad ditch, filled with stagnant water and rank weeds, on the land side, immediately under the ramparts. Within the fort there are cocoa-nut trees, bananas, and other vegetation.
	17, 18. There is no regular surface cleansing resorted to, except such as is adopted by the residents themselves; but the prisoners are daily employed in keeping the surface of the ramparts, esplanade, &c. free of rank vegetation. The cesspool is near the men's privies, and not far from the European hospital; but no offensive odours are produced thereby. The ventilation of the fort is rendered in a measure imperfect by the ramparts and the numerous houses belonging to civilians.
	19. The sanitary condition of the fort, taking the drainage, ventilation, water supply, &c. into consideration, must be considered as favourable. I have no remarks to make relative to the police of the bazaar. There is a fish market and a market for meat about a quarter of a mile from the fort, in and near which there is a bad odour; but this is not greater than is generally noticed in such places, and they are kept in good order. The houses of the natives inside and near the fort are of simple construction and kept tolerably clean. There are no dungheaps or cesspits within them to all appearance. No nuisance of a very noticeable character is caused in the fort by the wind which blows from the direction of the native buildings; yet at the same time I must remark that all along the beach human excretions are to be observed, which after all is greatly corrected by the strong sea breeze which blows over the fort.
	20. The slaughter-house for the military and the whole district is built some way out on the sea shore. The sea washes at high tide much beyond it, and carries away with it the offal. It is at least a quarter of a mile from the fort, and does not produce any offensive effluvia in the interior of the station. These places are under the supervision of the police, who have strict injunctions to enforce cleanliness, and to cause the removal of offal.
	21, 22. There are no horses, stables, or picketing grounds at this station.
	23. The married non-commissioned officers and men occupy separate rooms from the single men, and are tolerably well supplied with room. The "Ceylon Rifle" married men are also separated from the single men; but there is a part of their quarters which is objectionable, and which has been officially represented to the military authorities as being so.
Officers' Quarters.	1. There is a range of officers' quarters for four, which is just completed. It is high in elevation, opened to the sea breeze, and thus not deficient in ventilation. The drainage is of an ample nature, and the buildings are well furnished with every convenience.

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References to Subjects and Queries.	Replies.
IV. HEALTH OF THE TROOPS.	1. The station and surrounding country, as well as the small locations in this district, are almost free from epidemic diseases, and the general state of health of the population is very satisfactory. The military have also enjoyed a fair amount of health. 2. The diseases most prevalent among the native population are fevers, bowel complaints, and a peculiar disease arising from the impoverished condition of their blood, and also from hereditary syphilis. About two years ago cholera appeared in this province. Diseases of the spleen have not been particularly frequent. 3. The causes of unhealthiness among the natives are want of cleanliness, imperfect ventilation of their inside dwellings, and an impoverished diet. The hereditary syphilis to which sometimes a whole village is subject is kept up by these causes. 4. The 50th regiment, or rather a detachment at present at Galle, came to this station about 2¾ years since from Ireland. This detachment was six months at Colombo previous to being ordered to Galle. I cannot make the comparison between the present health of the men at this fort and that which they enjoyed at other stations without reference to the books at head-quarters. With regard to the general health of the company of the 50th regiment stationed here, I can speak favourably. The principal diseases have been febrile, for the most part of a severe nature. Rheumatism, boils, ulcers, and bowel complaints are the diseases from which they have chiefly suffered. I do not think there is any difference in the healthiness of the men's accommodation at Galle, comparing the 50th regiment with that of the Ceylon rifles. One portion of the men's barracks at this station is certainly more healthy than the rest by reason of its great height from the ground and openness to the sea breeze, but unfortunately that portion is occupied, by order of the local civil authorities, as the Custom House, P. and O. Company's office, &c., though essentially military buildings. 5. The troops have not been camped out since their arrival at this station. 6 to 16. No experience of hill stations. 17. There are few elevated sites near this station which would be advantageous over the present position occupied by the troops, as in the fort we get the full effect of the sea breeze unpolluted by passing over any land near it. There is a place about 1½ miles from this called "Bona Vista," which, I should suppose, is about 300 feet above the sea, and which also receives the effect of the sea breeze; but at its rear are paddy fields, and it might not prove much superior as a station to the present; and though its climate might be better than that of Galle, yet there might be many disadvantages. 18. The soil of the above-named place ("Bona Vista") is one of sand or gravel, with a subsoil of a clayey nature, and this I have observed to be the most favourable for military stations. 19. The best age for a soldier to be sent out to India is at 20 or 25 years. 20. I should think it would be of little advantage delaying troops at an intermediate station; they should be sent to India direct from the home depôts. I am of opinion that if the troops are landed in India at a favourable season, and precautions taken to prevent excesses, the men would suffer as little during the first months as at any other period of their service. 21. The mode of transport for troops from the port to the interior is by easy marches, there being no railway. No additional precautions are required for preserving the health of the troops on the route, but they should arrive at the halting place for the night before 8 o'clock a.m. 22. I should think 5 or 6 or 7 years for a continued time the longest period a British soldier should serve in India. 23. There is no conflict of opinion in the medical boards as regards invaliding. 24. I should consider that the best time for invalids to leave India for England would be about the month of March.
Diseases.	1. There is a health inspection in this garrison every Wednesday morning for the detection of cutaneous and every other disease. 2. Scorbutic disease has been almost unknown at this station for the last 10 years, only one admission into hospital having taken place from this cause; and this man was *en route* from India to Australia, and contracted it on board ship. The disease is attributable to the want of fresh meat and vegetables, combined with the want of exercise and the confined atmosphere between the decks of ships, and is for the most part prevented by the removal of these unfavourable circumstances. Bad water, or a too scanty supply, may also be considered as a great cause of this disease. 3. The proportion of hepatic diseases for 10 years was as follows:—Out of 1,581 cases treated during that period, 42 of hepatic diseases were admitted; and this is by no means a large number. Only one man died from hepatitis in 10 years. The causes of this disease may be considered to be obstructed perspiration, in consequence of incautious exposure at nights, redundance of bile caused by long-continued heat, irregular habits, and bad spirits. 4. Dracunculus I have never seen; and no case is recorded as having occurred among the troops for 14 years. 5. The venereal disease is by no means common among the troops at Galle; but I understand it prevails to a great extent among the native population. One hundred and ninety-five cases have been admitted in 10 years in all its forms. A lock hospital would be a benefit to the community at large, as well as to the soldiers. The only precaution for diminishing the liability of the soldier to this disease would be to cause all the infected women to go to hospital. The proportion of admissions from venereal diseases is 195 to 1,581 admissions from all diseases. 6. I am of opinion from my short experience that epidemic and endemic diseases are rare among the troops in this garrison, and I find that for 10 years there has been very little of either. Small-pox occurred in 1855, when three of the Ceylon rifles were mildly attacked by it. The following is a statement of the number treated in hospital during 10 years; viz., 1,621 admissions, of which 205 were from fevers. The medical officers in charge, at different periods, have all agreed in stating that they were mild in form; and this is clearly proved by the fact that out of 205 cases treated, only one death resulted. There were three forms of fever; remittent, of which 46 cases occurred.

References to Subjects and Queries.	Replies.
IV. Health of the Troops —*Diseases—cont.*	quotidian, five; and the remainder were common fevers; the death was referred to the common order. Three cases of cholera and one death occurred during the period referred to; a casual case or so, not justly referable to endemic or epidemic causes. Sixty admissions from dysentery, acute and chronic, occurred, with only two deaths out of that number. The cases of rheumatism were, acute, 52; chronic, 23. It appears, then, from the records of the European hospital for 10 years, that out of 1,621 soldiers treated, there were only 14 deaths, a proportion under one per cent.; and this must be a proof that the diseases generally were not of a severe nature, and the climate and station not inimical to the European constitution. 7. The most prevalent form of fever is the common continued. Ague is rare, and the remittent not of a severe nature. Rheumatism is not very common, and presents no remarkable appearances; in fact, the zymotic diseases are not of common occurrence. These diseases prevail, for the most part, during the hot weather; but there are no atmospheric conditions connected with their appearance that I am aware of. The irregular habits of some of the men are a common cause of fever and rheumatic affections; but I do not believe that want of ventilation, over-crowding, or bad drainage has been actually a cause of these diseases. The men bathe regularly twice a week, and attention is paid to cleanliness. There is one disease of a local nature, which is very common among the natives, viz., elephantiasis; this affects the lower extremities very frequently, and often the scrotum. It partly owes its rise to a venereal taint, want of cleanliness, and the relaxation of the climate. Europeans are also subject here, more than they are elsewhere, to a swelling of the scrotum and enlargement of the testes of a temporary nature, and not venereal. 8. Epidemic disease is of very rare occurrence, and there is nothing in the description of duty which can be considered as likely to have an injurious effect on the troops. Habits of irregularity are the only actual or apparently real causes of disease, with the continuance of hot weather during the dry season. 9. Small doses of quinine, as a prophylactic against malarial diseases, have not been tried at this station, as such a precaution did not appear necessary. 10. The station has been exempt from any epidemic disease for many years. My experience, and that of the medical officers who have preceded me, is of this nature, that the station is not one which has demanded any exertions of ours in the prophylactic department.
V. Intemperance.	1. The soldiers at this station are usually temperate; and I believe there are but few confirmed drunkards among them. 2. I find, on consulting the records of the European corps for 10 years, that only 14 cases were directly produced by drink. Intemperance I believe to be an indirect cause of an injurious character on the health of the troops. I cannot exhibit a table of the effect of total abstinence among soldiers, as there is no notice furnished on that point; but of this I have no doubt, that a man of temperate habits is much more likely to retain his health than either a total abstinence man or a drunkard. The statistics I have obtained from the records are as follows:—Out of 1,621 admissions in 10 years, only 14 were admissions from diseases caused directly by intemperance; but this, of course, is no positive criterion of the amount of drunkenness during that period. Drunkenness is always punished as an offence. 3. Distilled spirits are sold at the military canteen after evening parade; but they are to be had at the bazaar almost at all hours. The quality of the spirit is good. Some men drink more than others, and therefore no average quantity could be arrived at of any value. There is no spirit ration at this station; but on the march the men (Europeans) are allowed one gill a day, and in this instance I have very little doubt it is attended with very good effects. This allowance is in the shape of arrack, which is obtained from the commissariat department, and is of the best quality. One or two men may take an early dram; but it is not a common practice at this station. Spirit is never given as a ration to convalescents. Lemonade and soda water are sold at the canteens in the bazaar; but I am not aware that any injury to the health of the troops has resulted from the use of them. 4. The moderate use of spirits to most men is perfectly innocent, and indeed beneficial to many; but excess in this respect is injurious to health in all instances. If used in moderation, spirit is not conducive to any departure from discipline; but if taken in excess, it is often subversive of discipline. 5. There is no spirit ration at this station, and I do not think it necessary to recommend it. There are, however, two or three canteens of a low description inside the fort, over which the military authorities have no control, and if these were abolished good must necessarily result. The men get cheaper and inferior spirits at these places, which is a strong temptation for them to avoid the military canteens. 6. Malt liquors and wines, when of a good quality, have a great advantage over spirits; but cheap wine is generally very injurious to health. 7. Coffee, tea, lemonade, and soda water are used at this station in moderation, and are not injurious to health. As a rule they are superior to beer or spirit; as regards discipline certainly so. 8. There is no spirit ration, and I cannot recommend one to be resorted to. No case has come under my knowledge of convalescents being allowed spirits. 9, 10. No good would result from prohibiting the sale of spirituous liquors. If the men are inclined to drink spirit, they will if it is unattainable in the military canteens, go to places outside the fort, where bad spirits are sold by natives, over whom the military authorities have no control. Indeed this nuisance is carried to such an extent that we have at present a native canteen inside the fort, and it is not in the power of the military authorities to prevent it, though it has been represented as a positive nuisance, involving a bad example to the soldiers of the garrison, and causing additional work in the shape of soldier policemen, to prevent one from entering it. 11. The military canteen regulations are as follows:—The canteen to be opened from 12 o'clock to 10 p.m. for the sale of wine and beer only. No liquor of any sort to leave the canteen without a pass; but married men are permitted a restricted quantity for home consumption. No soldier is allowed more than a bottle of beer or a pint of wine in the afternoon. From 5 p.m. (or after parade) till 8 p.m. arrack is also

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References to Subjects and Queries.	Replies.
V. Intemperance—*cont.*	sold. No civilian is allowed liquor without a pass. The serjeant in charge of the canteen is held responsible for due order.
VI. DIET.	1. The ration of the Queen's British troops consists of 1 lb. bread, 1½ lbs. beef, 4 ozs. rice, 1½ oz. coffee, ¼ oz. tea, 1 oz. salt, and 1½ oz. sugar. Vegetables and other condiments or extra articles are purchased by the men themselves. These things are done in messes, which constitute a very superior diet to that which would be the result if they were cooked separately. The orderly officer of the day goes round the barracks with the view of examining the rations, and inquiring if the men have any complaints, and he is responsible to the commanding officer for the due performance of this duty. 2. There is not a complete ration at this station, including fruit and vegetables, but there is a stoppage of 1½*d.* a day from the men's pay for these articles. The men have three meals a day, viz., breakfast at a quarter to 8 a.m., dinner at 1 p.m., and tea at half-past 5 p.m. The whole stoppage daily from the men for messing is 5*d.* At breakfast they have coffee, bread, and ½ lb. meat fried; at dinner soup, made of beef and vegetables and bread. Tea consists of bread only, but most of them purchase milk for themselves, also eggs and fruits. The vegetables, for which the men themselves pay 1½*d.* a day, and which are made into soup for dinner, are generally in good quantity. 3. The ration the men get is very excellent, if vegetables were supplied by Government. The men are stout, active soldiers, and as a rule are in very strong health, and this is the best criterion that the ration is excellent in quality and sufficient in quantity. The men eat their meals in companies, and are all present at breakfast, dinner, and tea. They are not allowed to sell their rations, but they are permitted to exchange them for eggs, puddings, rice, and curry. 4. The cooking is performed by natives, who are supplied by the commissariat with the necessary utensils, viz., boilers, frying pans, saucepans, and pots of different descriptions. The kitchens are clean, well ventilated, and sufficiently supplied with water. The cooking is properly done, and there are no complaints among the men. Vegetables are supplied in good quantity, and tea and coffee are properly prepared for the men. They have coffee before a march. 5. The climate of this station is not suitable for gardening, as it requires much exposure to the sun, which is prejudicial to the health of European soldiers.
VII. DRESS, ACCOUTREMENTS, AND DUTIES.	1. The soldiers' dress and accoutrements at this station are as follows, viz., forage cap with a peak and white calico cover, white calico shirt, jacket, and trousers made of white American drill, boots of the usual ammunition pattern, and socks, either worsted or cotton. On night duties the red shell jacket is worn; pouch-belt with a waist-belt, from which are suspended the smaller pouch and bayonet. The present dress is considered as suitable to the climate, and I have no suggestions to offer regarding it. The guard dress consists of white American drill trousers, with jacket of the same material. Men on guard have the protection of good substantial guard-houses with verandahs.
Duties.	1. It is advisable that men be drilled at home before being sent to India; but so far as regards their health it makes no difference. 2. The usual routine of the soldiers' duties here is as follows, viz., gun fire at 5 o'clock a.m.; morning parade at 6 a.m. till half-past; garrison fatigue bathing or drill without arms; roll-call at 10 a.m.; evening parade from 5 till half-past p.m.; drill with arms. On Saturday marching order. Mounting guard about every fifth day. Company fatigues few. The best time for drills and parades is between 6 and 7 a.m., and between 5 and 6 p.m., and for marches between 3 and 7 a.m. There are general orders respecting these. The average number of nights the men have in bed during the week is four or five. 3. All the guards, with the exception of the Cutcherry guard, which is about a mile from barracks, are within a few hundred yards of each other. Guards last 24 hours by day and night. There are two roll-calls by night, and by day two and sometimes three. The effect of night guards on the health of the troops is not prejudicial. No additional precautions are requisite at this station.
VIII. INSTRUCTION AND RECREATION.	1. We have no ball courts or skittle grounds at this station, but there are a school (with a schoolmaster), a library, and a reading-room, which are sufficiently lighted at night. The detachment of gun lascars has a small garden attached to their quarters, which the men manage themselves. The school-room is now and then converted into a theatre, which is managed by the detachment of the 50th regiment. The detachment of the rifles and that of the 50th regiment play at cricket twice a week on the esplanade. These means of recreation and instruction appear sufficient to keep the men employed off duty. European troops off duty are restricted as to exposure to sun and rain out of the green facing their barracks, which is planted with sooraroo trees. 2. I have no improvements to suggest. 3. Soldiers' savings banks are in existence, and they are advantageous. 4. There is sufficient shade from trees called sooraroo, which are planted before the men's barracks and all round the parade ground facing the barracks.
IX. MILITARY PRISONS.	1. The military prisons here are well ventilated and arranged, and no case of sickness has originated, since my arrival here, out of any defect in their construction.
X. FIELD SERVICE.	1. There are no local regulations for field medical service not included in the General Regulations. 2. The practical working of the powers of the medical officers is harmonious enough. 3. No reply to this query. 4. The sick are generally transported in the "Pearl" steamer; but there are no special regulations bearing on these matters. The hospital supplies are conveyed in carts drawn by bullocks.

References to Subjects and Queries.	Replies.

XI. Statistics of Sickness and Mortality.

The following table shows the strength of white and native troops for ten years, with total admissions and deaths for that period:—

White.		Native.	
1st year	96	1st year	163
2nd ,,	126	2nd ,,	88
3rd ,,	127	3rd ,,	65
4th ,,	126	4th ,,	75
5th ,,	116	5th ,,	92
6th ,,	117	6th ,,	99
7th ,,	123	7th ,,	103
8th ,,	127	8th ,,	129
9th ,,	109	9th ,,	163
10th ,,	100	10th ,,	189
	1,167		1,166
Total admissions	1,846	Total admissions	1,163
Total deaths	14	Total deaths	7

This is a remarkably small per-centage of deaths. Colonel Tulloch gives the proportion of deaths to strength at Ceylon as 23 per 1,000; but this is less than half that proportion.

XII. Hospitals.

1. Plans of the hospital are herewith transmitted.
2. The position of the hospital as regards the barracks is very convenient. It is within 100 yards of the European barracks, on its left, right, and rear, with the exception of the quarter occupied by the royal artillery, which is about 450 yards from the hospital. There are no cavalry stables at this station. The bazaar, properly so called, is outside of and about half a mile from the fort. The houses of the civil population inside the fort are close to the hospital. The site of the latter is open, freely ventilated, and decidedly healthy.
3. The water supply of the hospital is abundant and good.
4. The hospital is built on a point of land projecting towards the sea. The impurities, refuse water, &c. &c., are emptied at the extreme point, and the sea at high tide effectually removes them.
5. The ward, the only one in use, is built on the solid earth, with no perflation of air beneath it. The soil is generally dry, and the ward also, but the atmosphere is damp. This arises from the strong sea breezes which prevail. There is a broad drain which runs along the side of the hospital, into which the roof water empties itself. This only occupies two sides, and on the others the rain is absorbed into the earth. On one side of the hospital the surface drainage requires to be attended to, but on the other side it is sufficient. The walls of the hospital are built of coral stones laid in mortar, and the roof is a tiled one. The walls and roof are single. The floors of the rooms and verandah are paved with tiles. The verandah of the patient's ward is 7 feet 8 inches wide. It affords sufficient shelter from the sun's rays, and is not used for the accommodation of sick, convalescents, or others. The hospital consists of one flat.

Table of Hospital Accommodation.

Date of construction unknown. It is believed to have been originally built by the Dutch.

Total number of wards, 1.

Total regulation number of beds, 16.

Ward. No.	Regulation Number of Sick in Ward.	Dimensions of Ward.				Cubic Feet per Bed.	Superficial Area in Feet per Bed.	Height of Patient's Bed above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents.				Number.	Height.	Width.
		ft.	ft.	ft.	ft.	ft.	ft.	ft.			
1 - -	16	70	21	11	19,845	1,240	92	21	—	—	—

The hospital is placed so as to receive the full benefit of the prevailing winds. The front windows consist of a frame, to which are hung vertically, on pivots, venetianed shutters opening outwards. The back windows have not venetian shutters, but paneled ones, opening outwards. This arrangement is conducive to ventilation and coolness.

6. There are no artificial means of ventilation to the wards, the air being admitted through the doorways and windows, and when the doors are closed, by means of the venetian shutters above alluded to, this arrangement is sufficient to keep the wards free from closeness and odour. The jalousies consist of flat pieces of wood, half an inch in thickness, and three inches in breadth. The circular mortices are drilled in the shutter frames, into which circular tenons, projecting from either end of each flap, are let. They are opened by means of a wooden rod, passing down the centre of the jalousies, and fastened to each flap with a wire, and the rod is kept in position by means of a button at top and bottom.

7, 8. There are no artificial means used either for cooling or warming the air admitted into the wards. The hospital is cleansed and lime-washed twice a year, or whenever it is considered advisable, on the requisition of the medical officer.

9. There are no watercloseets. The privy is situated at a projecting point of the ramparts, overhanging the sea shore, and is kept well washed by the waves at high tide, and it may be stated that it is very little offensive.

10. The patients are supplied with china or earthenware washing basins, and there is a large bath tub, which is only used when specially ordered. The convalescents are allowed to

GALLE. CEYLON.

References to Subjects and Queries.	Replies.
XII. Hospitals—*cont.*	bathe in the sea occasionally, in charge of a non-commissioned officer. A bath-room is required. 11. For the men who are seriously ill the only means of bathing is a bath tub, which is used when ordered by the medical officer. The washing basins are supplied by the commissariat. 12. The washing and drying of the hospital linen is performed by the natives per contract. 13. The store-room is sufficiently large and dry, but is much infested with rats, which often do much damage. 14. The bedsteads are large sized (of iron), with sacking bottoms, and some of them are furnished with the power of being elevated to any required height. The beds are filled with coir, but rather scantily at times, and I should recommend a larger quantity than that ordinarily used. The rest of the bedding is good in every respect. The hospital kitchen is situated in a back yard, sufficiently convenient to the wards, but not so close as to be in any way an annoyance from smoke or other cause. It is rather dark, and not sufficiently ventilated. There are boilers, frying pans, and other means of cooking, but there is no convenience for baking or roasting, otherwise than in chatties, which is inconvenient and not an efficient means. 16. The diet tables, diet rolls, &c. in use at this station are received from head-quarters, Colombo. The statistics of sickness, mortality, &c. are gathered from the annual sanitary returns of the station. 17. There are an acting hospital serjeant and one orderly to the European hospital. There are no nurses; but the two men are quite sufficient. 18. The sanitary condition of the hospital is such as to render any complaint unnecessary. No epidemic disease, hospital gangrene, or pyæmia, or any infectious malady has prevailed at any time in the wards. 19. There are really no suggestions required, except an additional drain along one side of the building, where at present the rain from the roof is absorbed into the ground at the base of the building. 20. The patients who are in the stage of convalescence have a broad verandah to walk in, which runs the whole length of the hospital. This, however, is barely sufficient, and of course a more extended means of exercise would be very advantageous. 21. Soldiers' wives and children are entitled to medical attendance and medicines. No further arrangements are made on this point; but I am of opinion that they should be entitled to medical comforts, such as wine, sago, milk, and other support, as the nature of their cases seem to require. At present there is always some difficulty in this respect. 22. There are no special local hospital regulations not included in the General Army Medical Regulations. 23. The medical officer has the power of suggesting improvements in everthing connected with the hospital. He can vary the diet, and has the power of giving such medical comforts as he may deem necessary. 24. There is no separate ward for convalescents. The hospital has generally been so little crowded that there has been no difficulty on this point; but should the hospital have its full complement of sick, a convalescent ward would be a great acquisition.
XIII. BURIAL OF THE DEAD.	1, 2. The burial ground for British troops is outside the fort, and the wind generally blows from the fort over it, seldom indeed from the burial ground. The distance is at least a quarter of a mile from the fort, and no perceptible influence springs from it, such as to affect the garrison. Its area is about an acre. The ground slopes very much, and the greater part is kept drained. The soil is Cabook gravel and some black earth, and underneath rock. No means can I discover of ascertaining the rate of decomposition positively. The burial grounds are kept in good order. 3. The regulations for the interment of bodies are as follows:—The graves are generally 7 feet 3 inches, or 7 feet 4 inches in length, 3 feet or 4 feet in breadth, a space of about 2 feet being allowed between each. The graves have never been re-opened, the burial ground being only of recent adoption. The depth of graves is about six feet. The general practice with respect to the military interments may be stated thus:—If a man dies during the night, he is generally buried about 5 o'clock on the following evening; but if the disease is of an epidemic nature, or very infectious, interment takes place sooner. This refers to native as well as to European troops. 4. The graveyards are never offensive. The usual practice is for the burial to take place about 18 hours after the decease of the soldier, but this rule is not strictly adhered to; if the disease has been of an infectious or putrescent character, it is performed earlier. The distance between the fort and the burial ground of the natives is greater. 5, 6, 7. No injury accrues to the public health from the present mode of disposal of the dead, nor are there any suggestions to be made.

(Signed) WM. C. VANDERSPAR, Major, C.R.R., Commandant.
F. R. WARING, Surgeon Major.
W. S. BOILEAU, Lt. R.E.

20th September 1860.

NEWERA ELLIA.

Accommodation—Queen's Troops—Infantry - 100.

References to Subjects and Queries.	Replies.
I. Topography.	1. The plain upon which the station of Newera Ellia is situated is surrounded on all sides by a mountainous country. The hills are covered with wood, and a dense forest intersected with ravines, which latter after a fall of rain are filled with water, envelopes the station. The plains upon which the cantonment is situated are swampy. 2. The elevation of the station above the sea is 6,200 feet, the adjacent country being on the same level. There is higher ground, called the "Horton Plains," about 20 miles distant, which is not subject to the continuous rains that fall in Newera Ellia during seven months of the year. The frosts, however, are more intense, and the air clearer, but there is not a plentiful supply of water near the plains. 3. The station is situate at the foot of a range of hills, without any table land near. Pedro-talagalla, the highest point in Ceylon, overhangs the plains, its summit being about two miles distant from the barracks. 4. The only water near the station is a small stream, which runs through it, and empties itself into the Mahawhilla Ganga. The vicinity is not liable to overflow at any season. There are several ravines running from the mountains above the station, but they have no injurious effect on health, being nearly dry during the fine season. 5. The station is freely exposed on all sides, and there is no impediment to free ventilation. The buildings in the cantonment are not exposed to reflected sun heat. The only two winds that blow over the station are the two monsoons, viz., the N.E. and the S.W., which are the only ones to which it is exposed. 6. The surrounding country is uncultivated, the cultivation of rice being prevented by the frosts. 7. A small native town, containing about 200 inhabitants, stands about a mile distant from the station. 8. The general surface of the soil of the district is black peat; the subsoil being either gravel or a species of soft cabook stone. There is no appearance of the ground having been occupied before the present station was formed. 9. There is always an abundance of water during the dry and rainy seasons, both from springs and small rivulets, which rise in the mountains over the station. 10. All the water, both from the rainfall and surface springs, is conducted by various streams into a small river, which, owing to the fall in the ground, carries off any quantity with great rapidity. No drainage from higher ground passes into the subsoil of the station, the drainage from the high lands being carried off by the ravines, which lead at once to the river. 11. The water supply of the station is derived partly from the river and partly from surface springs; none being stored in tanks. 12. The quantity of water at all seasons is unlimited, and its quality is good in every respect. 13, 14. No reply to these queries.
II. Climate.	1, 2. There are no instruments of any description for meteorological purposes. 3. The climate from the beginning of January to the middle of May is very dry; during the day the sun is powerful, but the nights are cold, the thermometer falling frequently below freezing point. For the remainder of the year the temperature, day and night, is much the same, the thermometer varying between 56° and 63° in the 24 hours. During this season few days pass without rain of a small drizzling kind, which sometimes lasts for weeks without intermission, accompanied by a dense fog. The climate is considered healthy for Europeans, as it has been selected as the sanitarium of the island; it is not, however, favourable for dysentery or acute disease of the lungs; in other cases the cool air has a very bracing effect on the constitutions of invalids sent from the low country. A portion of the men are employed by the Royal Engineer Department in keeping the buildings, &c., in repair, and they are able to work during any part of the day without injury to their health. There is no difference in the salubrity of the station during the wet or dry seasons, nor are there any diseases, except chronic cases sent here from the low country. 4. There is no district near the station the climate of which is more conducive to health than that of the station. 5. No reply to this query.
III. Sanitary Condition of the Station.	1, 2, 3, 4. Table of Barrack Accommodation. Total number of rooms, 2. Total regulation number of non-commissioned officers and men, 100.

Barrack-Rooms.	Regulation Number of Men in each Room.	Dimensions of Rooms.				Cubic Feet per Man.	Superficial Area in Feet per Man of Floor Space.	Height of Men's Beds above the Floor.	Windows.		
		Length.	Breadth.	Height.	Cubic Contents in Feet.				Number.	Height.	Width.
		ft.	ft.	ft.	ft.	ft.	ft.	ft, in.		ft. in.	ft. in.
1 barrack-room -	50	100	23½	17	39,950	799	47	1 8	8	4 5½	2 11
1 barrack-room -	50	100	23½	17	39,950	799	47	1 8	8	4 5½	2 11
Total -	100	—	—	—	—	—	—	—	—	—	—
Guard-room -	—	29	20	15	8,700	—	—	—	—	—	—
4 prison cells -	Each cell for one man.	8½	6	9	459	459	51	—	—	—	—

NEWERA ELLIA. CEYLON.

References to Subjects and Queries.	Replies.
III. Sanitary Condition of the Station—*cont.*	5. The windows are on opposite sides, and open in two pieces on hinges. There are no verandahs to the barracks, nor any jalousies or jhilmils. 6. Wooden cots are in use in the barracks, the mattresses and pillows for which are filled with loose coir. Iron bedsteads would be much preferable, as they would not harbour the fleas, which abound at the station, so much as the wooden cots. 7. No reply to this query. 8. The ventilation is kept up principally by means of the windows, but there are holes in the walls beneath the floor boards, which admit a current of air. The ventilation is sufficient to keep the air pure night and day. 9. The barracks are built of stone and roofed with felt. 10. The floors are of plank raised about 2½ feet from the ground, and have always a free current of air under them, introduced by ventilators in the walls. 11. The materials used in the construction of the barracks are quite suitable in a sanitary point of view. The barracks are kept in repair by the Royal Engineer Department, but from want of labour are not executed with any rapidity. The walls are coloured about once every year. 12. No reply to this query. 13. There is no washing carried on in the barracks. 14. The contents of the privies, which are collected in cesspools, are emptied from time to time as required, and buried at some distance from the barracks. 15. The barracks are lighted at night by four lamps in each room, which, however, give a very indifferent light. 16. There are no sewers; the barracks are drained by gutters on the surface, the contents of which fall, after traversing about 10 yards, into a small brook, which has always a certain amount of fresh water in it; the drainage is quite sufficient for all purposes. No part of any of the buildings is damp. There are no foul ditches. 17, 18. There are no old walls, hedges, or other obstructions to interfere with the ventilation of the station. 19. The bazaar is generally clean, with plenty of water flowing through it. The general condition of the native houses near the station is very filthy. No nuisance is experienced in barracks from wind blowing over the native houses. 20. Animals are slaughtered more than a mile from the station by a contractor, and no nuisance whatever is experienced from the condition of the slaughtering places. 21, 22. No reply to these queries. 23. The married men at the station are provided with separate accommodation.
Officers' Quarters.	1. The sanitary condition of the officers' houses is good.
IV. HEALTH OF THE TROOP	1, 2. The station, district, and adjoining population are very healthy, the prevailing disease with the latter being bowel complaints. 3. No reply to this query. 4. The troops at the station are composed of invalids from all parts of the island. No part of the men's present accommodation is more unhealthy than the rest. 5. The troops at the station are never camped out. 6 to 24. No reply to these queries.
Diseases.	1. There are inspection parades for the discovery of incipient diseases once a week. 2. There has been no scorbutus among the troops. 3. No hepatic disease occurs at this station. There are sometimes a few chronic cases sent from the low country for change of air. 4. No case of dracunculus has occurred at the station. 5. Venereal disease is of very rare occurrence here. 6. There are occasionally cases of dysentery and rheumatism among the troops; the proportion of admissions from these diseases to total admissions,—between the 1st January and the 30th September 1860,—being 7 in 26, and that of deaths to total admissions during the same period, being 2 in 26. 7. Dysentery is the only zymotic disease, and occurs generally during the wet season; but there is nothing peculiar in the atmospheric conditions which precede or accompany its appearance. 8. There is no epidemic disease at the station. 9. Small doses of quinine have not been tried as a prophylactic against malaria diseases. 10. No reply to this query.
V. INTEMPERANCE.	1. Intemperance is not greater here than at other stations in the island. There are no confirmed drunkards. 2. From the 1st January 1860 to the 30th September there have been altogether 26 admissions into hospital, and out of this number two cases have been directly from intemperance, but none indirectly. Drunkenness is always punished as an offence. 3. Distilled spirits are sold at the canteen, but the probable amount consumed by each man cannot be ascertained. Spirit is part of the ration at the station, but not on the march. One gill of arrack is issued daily at the dinner hour. It is never given to convalescents. No drinks other than intoxicating drinks are sold in the canteen or bazaar which are injurious to health. 4. The amount of spirit consumed by the men does not appear to have any injurious effect on their health. 5. If the sale of spirits was abolished in the military canteen, it would drive the men to the native arrack shops, where they would obtain a very injurious kind of spirit. 6. If malt liquor could be obtained at a reasonable price by the men, it would be much more beneficial than spirits. 7. Coffee, tea, lemonade, &c. are not much used at the station. 8. If beer could be substituted for spirits as a ration, it would be much better for the men. 9. It would not be beneficial to prohibit the sale of spirituous liquors in the canteens, and to permit only beer, coffee, &c., to be sold to the troops, because those men who prefer spirits to malt liquor would be driven to the native arrack shops. 10, 11. No reply to these queries.

References to Subjects and Queries.	Replies.
VI. Diet.	1. The soldiers' ration consists of fresh meat, 1½ lb., or salt meat, 1 lb.; bread, 1 lb., or biscuit, ¾ lb.; rice, 4 oz.; sugar, 1½ oz.; tea, ¼ oz., or coffee, 1½ oz. The ration is inspected by the officer commanding the detachment, or the surgeon. 2. Vegetables are paid for by the soldiers themselves, in addition to the stoppage for rations, which is 3½*d.*; they do not form part of the rations. The men have breakfast at 7½ a.m., which consists of ½ lb. of meat, tea or coffee, and bread. Dinner at 12 o'clock, consisting of 1 lb. meat, bread, rice, and vegetables. Supper is at 5½ p.m., at which the remainder of the bread and either tea or coffee are then taken. The quantity of vegetables bought daily is about 1½ lb. of either potatoes or cabbages for each man. 3. The ration is good and sufficient. It cannot be disposed of, at least not in an uncooked state, as the whole of the ration is handed over to the cook by the orderly corporal, who sees that the whole is returned when dressed. 4. There is an open fire-place with boilers and frying-pans for cooking the food. The kitchen is light, well ventilated, with plenty of water near. The food is boiled, baked, or fried, and is cooked in a satisfactory manner. Coffee is always taken before a march. 5. The men are at liberty to cultivate any portion of the ground in the vicinity of the barracks, and a great many gardens are in cultivation, filled with potatoes and the ordinary vegetables grown in England.
VII. Dress, Accoutrements, and Duties.	1. The dress and accoutrements of the soldiers are the same as those in use on home service, and are quite suitable to the climate at all seasons. The guard dress is exactly the same as that used on home service. The sentry is protected by a wide verandah in front of the guard-room.
Duties.	1, 2. The men at this station are either invalids sent from the low country for the benefit of their health, or artificers sent up for the purpose of building and keeping in repair the military buildings. The drill is only occasional, and takes place in the early morning. The climate will permit of drills, parades, and marches at any hour of the day without injury to the health of the men. The average number of nights the men have in bed during the week is four. 3. There is only one guard mounted, which is about 50 yards from the barrack-room, and is relieved every 24 hours. There is a roll-call three times a day, but none after 9 p.m. The night guard does not affect the health of the men.
VIII. Instruction and Recreation.	1. There is no ball court, and only a skittle ground at this station and a library, but no light is allowed at night. Soldiers are at liberty to cultivate any portion of the military reserve in the vicinity of the barracks, of which privilege about one half of the detachment avail themselves. The means are not sufficient to occupy the men, and some additional recreation is required during the wet season. No restriction is placed on the men with regard to exposure to the sun and rain when off duty. 2. A covered ball court would be the best additional means of recreation. 3, 4. No reply to these queries.
IX. Military Prisons.	1. The cells at this station have been built so far from the other barrack buildings that they are quite useless.
X. Field Service. XI. Statistics of Sickness and Mortality.	No information under these heads.
XII. Hospitals.	1, 2. The hospital was destroyed by fire a few months ago. One of the barrack-rooms is used as a hospital till a new one can be built. 3 to 13. No reply to these queries. 14. Iron bedsteads are used. The mattresses are stuffed with loose coir and the pillows with cotton. The bedding consists of blankets, sheets, and bed covers. 15. No reply to this query. 16. The diet tables and returns in use are those laid down in the Medical Regulations of the year 1859. 17. One hospital corporal, a private as orderly and another as cook, is the attendance provided for the sick, and is quite sufficient for the number of patients usually in hospital. 18, 19. The sanitary condition of the hospital is good, and no epidemic has occurred therein. No deficiencies are recorded. 20. No provision is made for the exercise of convalescents. 21. Soldiers' wives and children are treated in their own quarters. The present arrangements are merely temporary. 22. There are no special local hospital regulations not included in the General Army Medical Regulations. 23. The medical officer has the sole management of the sanitary matters connected with the hospital, as also of the diet and medical comforts. 24. There is no convalescent ward or hospital at the station, and none is required.
XIII. Burial of the Dead.	1 to 4. The dead of the British troops are buried in the church-yard, which is nearly a mile from the barracks, without particular regulation as to graves, &c., but the graves are made about 6 feet deep, and are usually about 4 feet apart from each other. 5, 6. The dead of camp followers or bazaar people are buried in a piece of ground outside the bazaar. No injury accrues from the present practice.

30th September 1860.

(Signed) E. Antrobus, Captain, 50th Regiment.
G. F. Davis, Assistant Surgeon, 50th Regiment.

LONDON:
Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

Digitized with financial assistance from

Government of Maharashtra

on 01 February, 2020